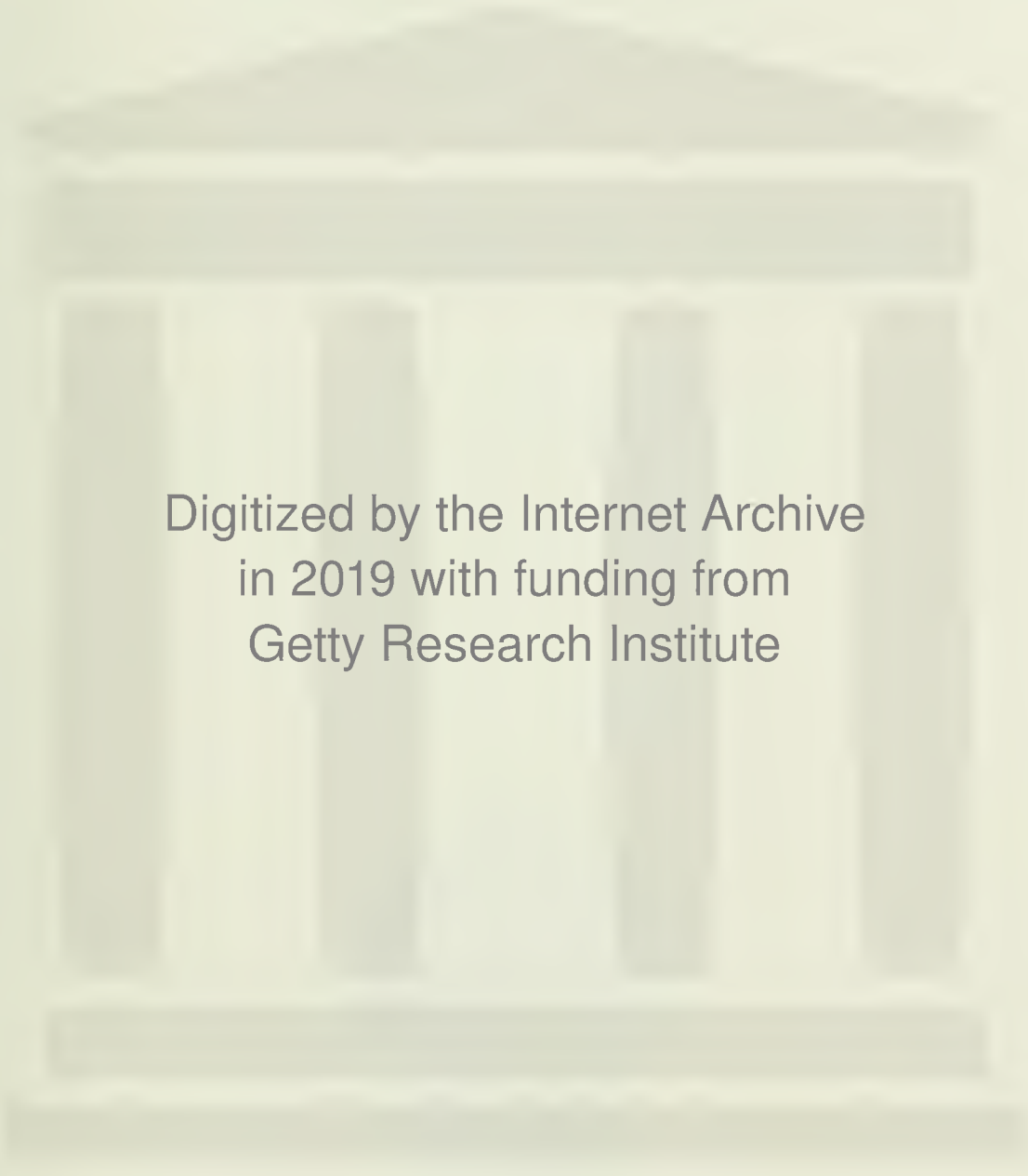


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TWENTIETH ANNUAL REPORT

OF THE

BUREAU OF AMERICAN ETHNOLOGY

TO THE

SECRETARY OF THE SMITHSONIAN INSTITUTION

1898-99

BY

J. W. POWELL
DIRECTOR



WASHINGTON
GOVERNMENT PRINTING OFFICE
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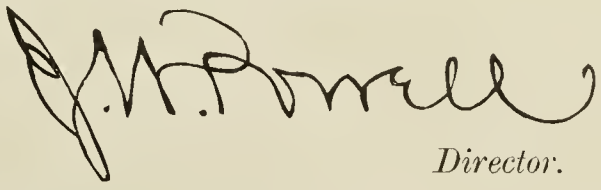
SMITHSONIAN INSTITUTION,
BUREAU OF AMERICAN ETHNOLOGY,
Washington, D. C., July 1, 1899.

SIR: I have the honor to submit my Twentieth Annual Report as Director of the Bureau of American Ethnology.

The preliminary portion comprises an account of the operations of the Bureau during the fiscal year, and the further development of a classification of ethnic science that has grown out of the Bureau's work in the last two decades; the remainder consists of a memoir on the native pottery of the eastern United States, which embodies briefly the results of many years' archeologic exploration by the Bureau, supplemented by study of all the important collections of aboriginal American pottery in the United States.

Allow me to express my appreciation of your constant aid and your support in the work under my charge.

I am, with respect, your obedient servant,



Director.

Honorable S. P. LANGLEY,
Secretary of the Smithsonian Institution.

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Aboriginal pottery of the eastern United States, by W. H. Holmes (plates I–CLXXVII, figures 1–79) 1

REPORT OF THE DIRECTOR

TWENTIETH ANNUAL REPORT

OF THE

BUREAU OF AMERICAN ETHNOLOGY

By J. W. Powell, Director

INTRODUCTION

Ethnologic researches have been conducted throughout the fiscal year ending June 30, 1899, in accordance with the act of Congress making provision "for continuing researches relating to the American Indians, under the direction of the Smithsonian Institution," approved July 1, 1898.

The work was carried forward in accordance with a plan of operations submitted on June 18, 1898, and duly approved by the Secretary.

Field operations were conducted in Arizona, California, Indian Territory, Maine, Nebraska, New Brunswick, New Mexico, New York, Oklahoma, and Ontario, while researches were made by special agents in Alaska and Patagonia. The office work included the collection and preparation of material from Indian tribes in Arizona, California, Colorado, Florida, Idaho, Indian Territory, Iowa, Nebraska, New Brunswick, New York, Oklahoma, Ontario, and in less quantity from other States and Territories, as well as from neighboring American countries.

As heretofore, the work has been conducted in accordance with a classification of ethnic science based largely on the special researches of the last two decades and developed largely in this Bureau. This classification has been set forth at length in previous reports and need not be repeated.

FIELD RESEARCH AND EXPLORATION

Early in the fiscal year the Director resumed the study of shell mounds and earthworks in Maine, and continued the comparison of aboriginal relics contained in these accumulations with the handicraft of the partially accultured aborigines still living in the adjacent forests and among the less-frequented inlets and islands of the coast. Some of the results were put in the form of a preliminary paper on "Technology, or the Science of Industries," designed for incorporation in this report.

Under a special authorization from the Secretary, the ethnologist in charge, Mr W J McGee, with Mr W. H. Holmes, of the U. S. National Museum, made an extended ethnologic and archeologic reconnaissance in California during October, November, and December. The districts examined comprised the western slopes and foothills of the Sierra Nevada, including the Table mountain region from Yuba river southward to Tule river; a portion of the northern Coast range region, centering about Ukiah; typical portions of the Sacramento valley, centering about Stockton, and the coastwise areas and offshore islands of the southwestern region of the state. The primary purpose was the collection of typical artifacts representing the aboriginal culture of the peculiarly interesting Pacific coast province; a secondary purpose was the collection of prehistoric relics, the comparison of these with the early historical period, and the general study of the culture history of the region; and a satisfactory degree of progress was made in the attainment of both purposes. The operations resulted in substantial enrichment of the Museum through the acquisition of new and representative material, and indirectly the opportunities for local work led to the acquisition of a highly useful collection of basketry—the Hudson collection—which throws much light on the aboriginal handicraft and motives of the California Indians.

In November Dr J. Walter Fewkes repaired to Arizona for the purpose of continuing researches concerning the winter ceremonies of the Hopi Indians, but soon after his arrival an epidemic of smallpox manifested itself in such severity as com-

pletely to demoralize the Indians and to prevent them from carrying out their ceremonial plans, and at the same time to place Dr Fewkes in grave personal danger. It accordingly became necessary to abandon the work for the season.

Early in the fiscal year an arrangement was effected with the managers of the Trans-Mississippi and International Exposition, at Omaha, by which Mr James Mooney cooperated with them in the installation and conduct of an Indian congress. In carrying out the plan Mr Mooney visited Indian Territory and Oklahoma, and successfully enlisted the sympathy and aid of representatives of various tribes, including the Kiowa, with whom he was intimately acquainted. Portions of the aboriginal material obtained in the field for the use of the congress were subsequently acquired for the National Museum.

In August Dr Albert S. Gatschet revisited New Brunswick for the purpose of continuing the collection and analysis of Algonquian linguistic material. He sought new aboriginal informants, and was able to make satisfactory additions to the recorded dialects of the measurably distinct portion of the great Algonquian stock occupying the northern Atlantic coast.

In September Mr J. N. B. Hewitt proceeded to various localities in New York and Ontario for the purpose of obtaining additional material pertaining to both the languages and the myths of the Iroquoian Indians, and the work, coupled with efforts to obtain certain unique objects for the National Museum, occupied him in the field until January.

During the autumn Mr J. B. Hatcher, who had previously brought from Patagonia certain valuable ethnologic material for the Museum, returned to the field and resumed collecting and the making of photographs illustrating the habits and habitations of the Tehuelche tribe and the natives of Tierra del Fuego. His work was not completed at the end of the year.

Dr Willis E. Everett, acting as a special agent of the Bureau, visited various remote districts in Alaska and contiguous British territory during the year, and obtained a quantity of linguistic data of considerable use in classifying the aborigines of a little-known district.

OFFICE RESEARCH

Work in Esthetology

Throughout much of the year the Director continued giving attention to the synthesis of data in the Bureau archives and in published form, with the view of organizing anthropic science, including ethnology in its several aspects. Among the subjects considered in detail was that of the more spontaneous human activities, normally pleasurable in character, which form the object-matter of esthetology. The researches among the aborigines have thrown much light on this subject, since the symbolic devices, sports, games, and ceremonies of the tribesmen are relatively simple and little differentiated, and hence are readily perceived and synthesized—indeed the synthesis of the esthetic and other activities rests primarily on the observations among the American natives, corroborated by critical observations on other primitive peoples, and finally attested by the facts manifested among advanced peoples. It is convenient to denote the primary activities comprised in the domain of esthetology as pleasures, since they are largely physiologic in character, though, like other activities, chiefly demotic (or collective) in their manifestations; and the activities may be classed as ambrosial pleasures, decoration, athletic pleasures or sports, games, and fine arts. The definitions and the classification of esthetology were formulated and printed in such manner as to facilitate examination and further discussion on the part of the collaborators of the Bureau and other students, and were finally incorporated in the last report.

In continuing his researches concerning the collections made in the Florida muckbeds, Mr Frank Hamilton Cushing was led to comparative study of a wide range of those products of primitive handicraft expressing symbolic ideas in form, function, and decoration; and certain of his generalizations are of much importance in that they afford a satisfactory basis for the classification and interpretation of many of the protean artifacts of primitive origin. His researches indicate that the primitive implement-maker is actuated by a few dominant

ideas, influenced largely by habit, and measurably controlled by simple associations; so that the products of his handiwork, when arranged by function and motive, may readily be grouped in a limited number of catagories, which are, at the same time, convenient and significant. The type of ideative association is exemplified by the tomahawk-calumet, which is at once a war weapon and an appurtenance of peace, and hence serves as a symbolic expression of willingness for war and readiness for peace at the option of the other party; the war concept is emphasized by decorative motives, usually derived from strong and swift animals, while the peace concept is strengthened by emblems in the form of feathers of small birds or other decorative symbols derived from gentle animals; and the antithetic symbolism serves to keep alive the opposing sentiments of amity and enmity in the primitive mind. In this and other cases, the recognition of motive on the part of the maker enables the student to reduce the chaos of protean forms of primitive artifacts to definite order. Although his work was somewhat retarded by ill health, Mr Cushing's progress in researches was satisfactory.

When compelled to abandon field work, for reasons already noted, Dr J. Walter Fewkes turned attention to the collections made during earlier seasons, and began the preparation of a memoir treating of the decorative symbolism of Pueblo pottery. This memoir was nearly ready for publication at the close of the fiscal year; it embraces various new interpretations of importance, the account of which is reserved for a future report.

Work in Technology

As has been noted, the Director made observations on the aboriginal technology revealed in the contents of shell mounds and tumuli in Maine during the earlier part of the fiscal year; and these observations, with other data, were subsequently utilized in defining the science. The technical activities are intimately interrelated, and combine to form a complex group, which is commonly assumed to be irresolvable with scientific precision; but the relations of the activities are so well displayed in primitive culture like that of the American aborig-

ines as to suggest a convenient arrangement for the use of investigators, and such an arrangement has been formulated and placed within reach of the collaborators and others for subjection to the test of actual use. In this arrangement, industries are classified as (1) simple production or substantiation, (2) construction, (3) mechanics, (4) commerce, and (5) the preservation, reconstruction, and improvement of the human body by a series of processes conveniently connoted by the term medicine. Provision has been made for completing and adding details to the outline already prepared, in a form suitable for publication in another part of this report.

Mr Cushing's researches have served to illumine those early stages in the growth of industries in which utility was but vaguely perceived, and in which processes were largely ceremonial or symbolic, as when the hunter sought success by imitating the attitude and actions or by arming himself with the beak or claws of a raptorial tutelary. The researches conducted in the Bureau have already rendered it clear that decoration, as indeed the greater portion of the fine arts, arises in symbolism and develops through conventionism; and the researches of the year suggest a related genesis for industries. The results of the work are in preparation for full publication.

While among the surviving aborigines of California, Mr W J McGee was enabled to make observations corroborating and extending generalizations already framed with respect to those of the primitive industries involving the use of stone as material for implements. The several tribes studied may conveniently be classed as Acorn Indians, since acorns form their principal source of food, and since their characteristic industries are conditioned by this food supply. Some of the processes and implements vary from tribe to tribe; for example, in some tribes the acorns are cracked in the teeth in order that the meats may be extracted, in others they are cracked with spheroidal hammer-stones, and in still others an elongated pestle-like stone, grasped by one hand and used in the fashion of a club or civilized hammer, is employed for the same purpose. Other devices, such as those used for grinding the acorn

meats, are substantially alike from tribe to tribe; though it is noteworthy that in each tribe there is a diversity growing out of the age of the apparatus, or the degree of development by use. Thus it is found that the nether millstone, which may be either a ledge or other mass in place of a portable bowlder, is, in the earlier stages of use, a flat or slightly concave metate, which after more extended use becomes a deeply concave metate, still later a shallow mortar, and at length a deep mortar, which may eventually be worn through if the original mass is not more than 9 to 15 inches in thickness; while the grinding-stone concordantly changes from a simple roller or crusher to a mano (or muller), and finally to a pestle, at first broad and short, but afterward long and slender. It follows that in this region the northern device of the mortar and the southern device of the metate overlap; yet it is much more significant that the overlapping is essentially genetic and only incidentally geographic. Not infrequently the genesis of an individual mill corresponds with the rise and passing of a family; the young woman may begin life with a bowlder having one flat side and a few river-worn cobbles as a mill; the bowlder is then used as a metate and the cobbles as mullers; gradually the mill develops into a mortar with a well-rounded and polished pestle, both shaped chiefly by wear, perhaps supplemented by slight dressing. On this the matron grinds vigorously in her old age for the support of her daughters and their husbands and the growing grandchildren; and on her death apparently the pestle is broken and the bottom is knocked out of the mortar. Neglecting the final act, the individual growth of the primitive mill well epitomizes the phylogeny of its species, and demonstrates that in general the mortar must be regarded as the differentiated and eventually degraded offspring of a metate-like prototype, whence sprang also the metate along one line and the quern and its derivatives along another. It is particularly significant, too, that the milling apparatus still used by the Californian natives consists initially of naturally-formed ledges or bowlders, with stream-worn cobbles for grinders, and that both bowlder and cobble are, for the most part, shaped gradually by wear, with-

out definite recognition of the shaping on the part of the operator—i. e., that the mills represent protolithic culture, rather than the technolithic art characterized by designs and models.

The plan for the Indian congress at Omaha (mentioned in a preceding paragraph) was formulated chiefly by Mr James Mooney, in connection with Honorable Edward Rosewater, president of the board of publicity and promotion of the exposition, though conditions connected with administrative control and policing of the Indians assembled on the grounds led to the assignment of a representative of the Indian Bureau, Captain W. A. Mercer, as officer in charge of the congress; but Mr Mooney cooperated in the installation and remained on the ground throughout the exposition. In accordance with the plans of Mr Mooney and Mr Rosewater, the Indians were domiciled, so far as was practicable, in houses or lodges of their own construction, and of more or less strictly aboriginal type; accordingly the installation afforded an excellent opportunity for the study of native house building, and of the ceremonies connected with the highly interesting house-cult of the native tribes. Among the lodges were two Blackfoot skin tents, made and decorated in aboriginal fashion in every respect, save that cow hides were substituted for buffalo hides. A lodge of special nature was a Wichita grass house, which faithfully exemplified the aboriginal construction, since the structure was an actual example, the oldest in the Wichita village in Indian Territory; this was repaired, taken down, and reconstructed by aged men and women conversant with the house-cult of the tribe. At the close of the exposition this specimen was obtained for the National Museum. These and other structures erected at Omaha and carefully studied by Mr Mooney have added materially to the knowledge of aboriginal houses.

The researches in California by Mr McGee and Mr Holmes extended to basketry and added materially to knowledge of the processes of basket making, especially among the Pomo and Yokai tribes. The Hudson basketry collection comprises examples of twelve different weaves, which have been carefully studied by the collector, Dr J. W. Hudson, and are described

fully in his catalog; and, in addition, several processes were critically studied in actual use by basket makers. The functions or purposes of the baskets also received careful attention. In this region they form the common utensils of the householders, taking the place sometimes filled by fictile ware, and serving various other purposes. They are used as cups, canteens, and other water vessels, as pots for boiling acorn meal and meats (by means of heated stones), as receptacles for stored foods and liquids, and especially as ceremonial and sacramental objects. The researches concerning the aboriginal basketry of California promise important results along different lines as the work proceeds.

Work in Sociology

The synthesis of activities by the director extended into the domain of institutions during the year, and the science was characterized and formulated in a preliminary way; but, since the institutional activities are still more complex than the industrial activities, and since the data available in the archives of the Bureau are exceedingly voluminous, the formulation was not completed at the end of the fiscal year, though the results will be ready for incorporation in another part of this report.

In the course of his researches among the California Indians, Mr McGee obtained certain data tending to explain the linguistic diversity which so strongly distinguishes the Pacific coast province from the major portion of the continent—a diversity expressed by the fact that four-fifths of the area of the continent are represented on linguistic maps by only about one-fifth of the linguistic stocks, while the remaining four-fifths of the stocks are concentrated in less than one-fifth of the area, skirting the Pacific coast. In the first place, various indications were found that the human period in this region has been relatively short, or at least relatively uniform and uneventful; for, while most portions of the country reveal some evidences of culture-succession, the Californian region reveals but a single culture-type in the relatively rare artifacts scattered over the surface or still in use among the tribal remnants; so that, on the whole, the region impresses the student as one of either

short or slow, and, in any event, relatively slight, demotic development. In the second place, it was ascertained that the tongues of the several tribes are in exceptional degree held as esoteric or sacred. It is common among all primitive peoples to surround personal names and ceremonial terms with more or less secrecy or mystery, but it is not common to similarly guard and sanctify ordinary speech; but the Californian tribes subjected to study apparently hold as sacred not merely personal names, but the name of the tribe and many if not all the common terms of their language; indeed, it would appear that they regard language as forming the primary basis of their social organization, or at least as a tangible and definite expression of consanguineal relation. A third factor in the organization of the Californian aborigines grows out of their industrial status. Since their chief food source is the acorn, and since the oak trees never grow in continuous forests, but are somewhat sparsely distributed among other trees or over the openings of the valleys, the native population was necessarily sparse and scattered, and each tribe tended to remain permanently attached to a definite range; and this sparse distribution permitted and promoted the retention of tribal dialects corresponding to each range. A fourth factor appears in ceremonial observances, apparently growing out of the industrial condition, notably the affine tabu which prohibits communication between sons-in-law and mothers-in-law, and among some of the tribes between daughters-in-law and fathers-in-law and other connections by marriage. The linguistic, industrial, and ceremonial factors all operate as repulsive forces tending to prevent aggregation of population and intercommunication of tribes, and hence to retard cultural development; and it would appear that the several factors, interacting with cumulative effect, have combined to produce the singular concentration of linguistic stocks in the Pacific coast region. Mr McGee also noted a hitherto neglected factor tending toward the actual differentiation of speech, i. e., the custom of dropping from daily use all terms connoting the names of decedents (which obtains also among the Kiowa and some other tribes); and it is significant that this custom tends to produce lexic rather

than morphologic changes, and hence to bring about the precise conditions long known to be characteristic of the Californian tribes. The researches concerning this subject are not yet complete.

During the earlier part of the fiscal year Mr Mooney continued researches relating to the Kiowa Indians and noted as a conspicuous characteristic of the tribe the apparent absence of a clan or gentile system; for, despite his intimate acquaintance with and adoption into the tribe, he has never been able to discover unmistakable traces of this commonly prominent feature of primitive social organization. This peculiar characteristic has received attention from the Director and Ethnologist in Charge, and an apparently satisfactory explanation has been discovered: On reviewing the tribal customs it became evident that the widely roving Kiowa enjoyed contact with other tribes, and consequent acculturation in an exceptional if not unique degree. Sometimes the association was amicable, when ideas and devices were freely interchanged; not infrequently the contact was inimical, when the Kiowa were commonly enriched by the acquisition not only of plunder but of captives who were subsequently adopted into the tribe; and the general effect of the wide association was to extend the intellectual range and differentiate the blood of the Kiowas. Especially important was the habitual adoption of captives, the effect of which is always to introduce arbitrary relationships tending to break down the natural kinship system; yet hardly less important were the oft-recurring excursions for hunting and plunder, since they involved more or less arbitrary extensions of the consanguineal organization, somewhat analogous to those attending the development of patriarchy among regularly nomadic peoples. Collectively, the consequences of the roving and predatory habits of the Kiowas must have been to subordinate, in exceptional if not unique degree, the prevailing kinship organization characteristic of primitive society and to gloss or even to replace it with the more strictly artificial or demotic system corresponding to that of higher culture The results of Mr Mooney's researches concerning the distinctive organization of the Kiowas will be incorporated in a memoir on the heraldic system of the tribe.

Work in Philology

Toward the end of the fiscal year the Director made progress in systematizing the rich linguistic collections in the archives of the Bureau, with a view to formulating plans for further research concerning the aboriginal tongues of America; the results are to be made ready for another part of this report.

Mr J. N. B. Hewitt continued the collection of Iroquoian material, both linguistic and mythologic, and made satisfactory progress in preparing it for publication. His studies illustrate the importance of combining inquiries concerning primitive myths with linguistic inquiries. Thus, certain puzzling inflections introduced in various terms eluded the best efforts toward analysis throughout the earlier portion of the year; but, on studying the creation myths with the aid of native informants in the course of his field operations, he ascertained that these obscure inflections connote a characteristically primitive notion concerning individual activity or power; for example, the shaman is supposed to work magic by the sound of his rattle or drum, and the witch to work her evil charms by the action of singing, both acquiring their mystical powers only by and through the supposedly mystical exercise of function in producing the sound, and it is the purpose of some of the obscure linguistic inflections to denote the mystical states recognized in the mythology. It is well known that the aboriginal languages possess inflections for normal states, such as sitting, standing, reclining, and moving; but the recent researches show that there are inflections also for mystical states, and that some of these quite significantly correspond with the inflections for singing or dancing. A preliminary announcement of results has been made, and formal publication will follow so soon as the inquiry can be considered complete

Dr Albert S. Gatschet continued the preparation of the comparative vocabulary of the Algonquian stock, and at the same time, according to custom, compiled linguistic material for use in reply to numerous inquiries from correspondents for aboriginal terms to be applied to parks, vessels, villages, etc., and

for the meaning or etymology of aboriginal terms already in use. The field operations of the year materially enriched the comparative vocabulary, which has already attained such volume and completeness as to yield standards for classifying the tribes comprised in the extensive stock to which it pertains.

Working under a small allotment, Dr Franz Boas continued the preparation of linguistic material collected among the tribes of northwestern United States and contiguous Canadian territory. The principal contributions of the year comprise a complete Tsimshian vocabulary and a considerable collection of texts. The texts are in form for publication, and will be published in the series of Bulletins recently authorized by the Congress.

During the year the Bureau was so fortunate as to obtain, through the courteous offices of Dr Edward Everett Hale, the vocabulary of the Massachusetts (Natick) language laboriously prepared by the late J. Hammond Trumbull, and good progress has been made in arranging the material for publication.

Work in Sophiology

Throughout the history of the Bureau, it has been the policy to organize the lines of research in such manner as to permit comparative study of well-defined categories of activities and activital products. The maintenance of this policy has been particularly difficult in connection with the science of opinions, or sophiology, since the object matter of the science is more elusive and complex than that of any other branch of knowledge; yet fair progress has been made in the introduction of the comparative method in even this branch of inquiry. During the year the Director brought together the data required for a characterization of the science of sophiology in general terms, and this outline will be found on other pages of the present report.

Mr J. N. B. Hewitt made an important comparative study of the creation myths of several Iroquoian tribes and of two or three Algonquian tribes. The results, which are of much interest, are practically ready for publication. The comparative method was used with success also by Dr J. Walter Fewkes

in the interpretation of the symbolism depicted on the pottery of the Hopi and other Pueblo peoples, while the results attained by Mr Cushing in his technologic researches were made tangible only by constant use of the comparative method in seeking the mystical motives of the primitive artisans. Progress has been made by the Director in formulating the method for the guidance of future inquiries.

Although retarded by ill health, Mrs M. C. Stevenson made substantial progress in her analysis and discussion of Zuñi mythology during the year, though the portions of her memoir already completed have been withheld from publication pending the revision made necessary by further researches concerning certain of the ceremonies.

Toward the close of the fiscal year Mr McGee undertook an inquiry concerning certain mystical symbols, such as that known as the swastika, so common among the decorative devices of the American aborigines, and these graphic devices were compared with the mystical number systems involved in the primitive Cult of the Quarters. The investigation served to indicate that neither finger counting nor quinary and decimal number systems are primitive, but are products of binary and quarternary systems, modified through magnification of the Ego in the manner described in previous reports. The inquiry also afforded useful results bearing on the development of right-handedness and on the orientation instinct which survives even in the highest culture stages. A preliminary discussion was incorporated as an accompanying paper in the last report, but the principal results are reserved for incorpotion in a memoir dealing with the time concept of the Papago tribe.

Toward the close of the year Dr Cyrus Thomas was led to a comparison of the number systems of the northern tribes with those revealed in the codices and other aboriginal records of Mexico, and prepared a memoir on the subject, which was incorporated in the last report.

After his return from Omaha, at the close of the Exposition, Mr Mooney began preparing for publication his extensive collection of Cherokee myths and searching for parallels in the

records comprised in the archives of the Bureau, as well as in the published literature; and his voluminous memoir was completed in time for incorporation in the last report.

Work in Descriptive Ethnology

Mr F. W. Hodge continued supervision of the material for the Cyclopedia of Indian Tribes and made such additions to the work as his duties in other directions permitted. Dr Cyrus Thomas spent the greater part of the year in reviewing and extending that portion of the work relating to the tribes of the Siouan stock. His progress in examining the extensive literature involved and in preparing the material for publication was satisfactory. During a portion of the year Colonel F. F. Hilder, ethnologic translator, was occupied in translating archaic Spanish records of especial value in connection with the Cyclopedia. One of these is a manuscript written in 1782, and describes the tribes of Texas with unequaled fullness. The manuscript is anonymous, but Colonel Hilder succeeded in identifying the author as Padre Morfi.

Miscellaneous Work

Library and publications. Mr F. W. Hodge has remained in charge of the library, and has also continued editorial work on the reports. During the year he outlined a plan of library arrangement on the basis of the classification of anthropic science set forth in this and preceding reports, thus preparing the way for a systematic catalogue for the use of the collaborators and the many visitors to the Bureau. The editorial work of the year has been especially arduous by reason of the considerable volume of matter in the hands of the printer and the number and elaborateness of the accompanying illustrations, but his work has been performed with energy and ability.

Translation. During a considerable part of the year Colonel F. F. Hilder has been employed as ethnologic translator, and, in addition, has performed the duties of chief clerk. One of his translations is noted in an earlier paragraph; others made from time to time as needs arose have greatly facilitated the

preparation of the Cyclopedia of Indian Tribes, the researches concerning the Seri and Papago Indians, and other lines of work.

Illustrations. Mr DeLancey W. Gill has remained in charge of the photographic laboratory and of the preparation of illustrations by other than photographic means, and the progress of his work has been highly satisfactory. The additions to the photographic negatives representing Indian visitors to Washington and the work of field parties have been unprecedented.

COLLECTIONS

Among the special collections made during the year were those of Mr McGee and Mr Holmes in California, comprising stone artifacts in considerable number and variety, baskets, and other objects, the collections being of special value in that they represent typical prehistoric workmanship and typical modern workmanship combined, and in that they were made on the ground by experts in archeologic and ethnologic research. Another collection of special interest, though of somewhat limited extent, was made in southern Patagonia and Tierra del Fuego by Mr J. B. Hatcher; a portion of the material was received during the year. A number of typical collections made by correspondents of the Bureau and others were also acquired during the year. One of these includes the Wichita house and house furniture obtained by Mr Mooney, mentioned elsewhere; another is the suit and regalia of Kahkewaquonaby (afterward called Dr Peter Edward Jones), a member of the Messissauga tribe of the Ojibwa; a third is a small but rare and significant lot, including a beautiful example of the stone yoke, or ceremonial collar, obtained from Mexico through the agency of Mr Holmes.

PROPERTY

The property of the Bureau was classified and described in some detail in a previous report. During the past year a number of manuscripts have been added to the archives, chiefly by contribution from correspondents, and others have been

produced. The collection of photographs of Indian subjects has been materially enlarged, partly through photographing the individuals and groups of Indian delegations to Washington; while the library has increased at a normal rate, chiefly through exchanges.

FINANCIAL STATEMENT

Appropriation by Congress for the fiscal year ending June 30, 1899, "for continuing ethnological researches among the American Indians, under the direction of the Smithsonian Institution, including salaries or compensation of all necessary employees and the purchase of all necessary books and periodicals, $50,000, of which sum not exceeding $1,000 may be used for rent of building" (sundry civil act, July 1, 1898)			$50,000.00
Salaries or compensation of employees		$34,306.34	
Special services	$414.23		
Translating	75.00		
Traveling and field expenses	2,114.19		
Ethnologic specimens	4,499.00		
Publications	453.33		
Drawings and illustrations	574.25		
Books and periodicals for library	1,164.70		
Office rental	916.63		
Office furniture	63.81		
Stationery, supplies, etc	1,692.92		
Freight	377.35		
Postage, telegrams, etc	41.51		
Miscellaneous	271.74		
		12,658.66	
Total disbursements			46,965.00
Balance, July 1, 1899, to meet liabilities			3,035.00

CHARACTERIZATION OF ACCOMPANYING PAPER

Primarily Professor Holmes's monograph on aboriginal pottery of eastern United States is a description of the fictile ware classified by districts, so far as practicable by tribes, and also by technologic types. The art of the potter is old, far older than written history, so that its beginnings can never be traced directly. The antique and prehistoric wares themselves yield a partial record of the development of the art, and the archeologists of the Old World have been able to supplement and extend the written history of pottery making through study of such material, and their researches have lent interest to the ancient vessels and sherds with which the museums of the world are enriched. Yet the fictile ware of Egypt and Babylonia, Etruria and India, and other Old World provinces falls far short of telling the whole story of the art, since it fails to reveal the actual motives and sentiments of the early artisans—the relics are husks of the history of pottery making without the vital kernel. Accordingly the archaeologic studies in America supplement the European researches in a highly useful way. In the first place, the period of pottery making by the American aborigines was comparatively short, so that the prehistoric and the historic are closely related; and, in the second place, the several living tribes within reach of current observation represent various stages in the development of the art, so that opportunities exist in America for studying the motives and sentiments of the artisans engaged in all of the earlier developmental stages of the art. In general, the craft of the potter may be said to arise in the social stage of savagery or the psychic stage of imitation, with its tedious growth through accidental improvement; in general, too, the art may be said to expand and differentiate in the succeeding barbaric stage with the attendant divinatory

concepts as motives; and it is this stage, with its protean forms, textures, decorative devices, and modes of manufacture, which has been found peculiarly inscrutable by students of the products alone. Now it is precisely this stage which is represented by most of the American aboriginal ware, both prehistoric and historic, and by the surviving tribes. Accordingly, Professor Holmes's description of the American ware, with its critical analysis of types and interpretation of motives, would seem to afford not merely a supplement to, but a sound foundation for, the history of the potters' art.

TECHNOLOGY, OR THE SCIENCE OF INDUSTRIES

Introduction

In former reports I have classified human activities as pleasures, industries, institutions, expressions, and opinions. In my last report I discussed pleasures as the science of esthetology. I now propose to set forth the nature of industries as the science of technology, of institutions as the science of sociology, of expressions as the science of philology, and of opinions as the science of sophiology.

An industry is an activity whose immediate motive is the production of welfare for self and others. The term welfare has various meanings, but here we use it as signifying welfare of life—not esthetic, moral, expressional, or mental welfare. An industry by this definition means an activity exercised to promote life. We must remember that in this discussion, which is meant to be scientific, whether it succeeds or not, the term *industry* is used in this sense and in no other.

We use *activities* as a generic term including five species: esthetics, industries, institutions, expressions, and instructions. In this paper we are to consider industries.

Technology is the science of industries. An industry is an activity whose purpose is welfare or livelihood. We must here make clear the distinction between esthetic activity and industrial activity. The maid dances for the pleasure of herself or of others. If she dances for others it is a pleasure for them, though she may dance for gain—that is, welfare; still, it is an esthetic activity. A company of musicians make music for an audience; the audience pays for the entertainment. To the musicians the making of the music is an industrial activity, but to the audience it is an esthetic entertainment. Thus, whether an activity be designed for pleasure or for welfare will often depend on the point of view of the person interested therein.

The housewife prepares the meal for her own welfare and for the welfare of others. She may flavor the food to make it more palatable; the purpose of the condiment is thus pleasure; but the preparation of the food is still an industry, the secondary motive a pleasure. A feast is given for pleasure, but the food still sustains life; so pleasure and welfare are concomitant. In high civilization many activities are pursued for the pleasure of the people by persons who have welfare as their purpose.

Again, what is conducive to welfare may be productive of pleasure. The housewife in preparing the meal for welfare may have, and usually does have, these double motives. If we neglect the motive of welfare and act only from the consideration of pleasure, pleasure itself may be curtailed or pain may be produced. If the housewife, in catering to pleasure, uses condiments that are unwholesome, pain may be produced, and whether her act in compounding the cake be good or evil in effect will depend on whether she has considered both welfare and pleasure; only then do her acts become wise.

Motives are many and usually compound, and it requires no small degree of abstraction to discover the elements of motive even in self, while in others, whose minds are expressed in their acts, the task is still more difficult; for though the motive is best read in symbols of deeds, still, whether it be good or evil is often difficult to say. But every activity is performed for a purpose, and all demotic activities are performed for demotic purposes. We are now classifying activities as demotic activities; but in classifying them in this manner we must ever remember that altruism is founded on egoism and that a demotic activity has an individual effect on the doer. A man may play the violin for others in order to gain money with which to make a journey of pleasure; thus his motive may be immediate pleasure for others and remote pleasure for himself.

This is a concrete world, and abstractions do not exist in themselves, but only in human consideration as abstracts. Every abstract has its concomitants from which it can not be dissevered, except in consideration. We may classify motives as motives for pleasure, welfare, peace, expression, and wisdom; and by abstraction we may consider anyone of these

motives, although they can not exist apart. Every activity, when performed, involves all the concomitant effects. The world is concrete, but the method of consideration is often abstract.

Industries are classified as substantiation, construction, mechanics, commerce, and medicine.

Substantiation

Certain activities of welfare are fundamental thereto, because they are necessary to life. We must breathe air, we must drink water, we must eat food, we must seek shelter from the elements, and we must wear clothing In the pursuit of these necessities of life human activities are employed, even in the primordial stage of savagery. Four of these necessary activities are pursued by the lower animals—they seek water, food, and shelter for their young and sometimes for their companions—but artificial clothing is not worn by them. Activities pursued for the welfare of self and others are industries.

The natural kinds fundamentally necessary to man are found by experience to be air, water, rocks, plants and animals.

Air is necessary at every minute of life, and it is so abundant that man is not required to produce artificial air, though as civilization advances he finds it necessary to provide for its purity.

Water also is abundant. Man does not find it necessary to produce water from its elements, but he does find it necessary to produce it at the place where it is needed and to provide for its purity.

Minerals are found to be useful to man primarily, perhaps, for shelter; soon they are found useful as tools, and he engages in their production by quarrying and mining.

Plants are found to be useful to man as food in all its varieties, as sap, leaves, bark, roots, seeds, and fruits. Plants are also useful to man in providing shelter, and various parts of the plant are used in the construction of houses by human devices. Plants are also found useful to man as fibers in clothing.

Finally, animals are useful to man for food, shelter, clothing, and other purposes.

Thus, tribal man utilizes all of these kinds or natural substances, for which he especially develops the industries of quarrying (the simpler stage of mining) and agriculture for the production of natural plant products and natural animal products. Tribal man uses natural substances developed by natural chemistry; civilized man not only uses the natural substances, but he produces innumerable artificial substances by artificial chemistry.

The production of kinds or substances, whether natural or artificial, leads to the distinction which we are trying to make of the class of industries which we call fundamental industries. They are those in which men engage for the purpose of producing substances, whether they be natural or artificial. Fundamental industries may well be called substantial industries because they produce substances.

All industries are productive industries, and the product is consumed. Production is thus the correlative of consumption, and correlation must be distinguished from reciprocality and from antithesis. Reciprocality is a relation as of a whole to the parts of which it is composed; antithesis is a distinction as between good and evil; correlation is a relation between terms neither one of which can be expunged alone.

We must make a distinction between producing kinds and producing forms. A man may produce apples by cultivation; he then produces a kind; when he produces cider from the apple he produces another kind or substance. A man may produce a flint by quarrying it, or he may produce it even by picking it up; he then produces a kind of rock; but when he makes the flint into a knife, he produces a form.

In tracing a series of transmutations from material to product, we may always reach a stage where the material is finally consumed or used. To use an unfamiliar but very useful term, borrowed from metaphysic, we may say that an entelechy is ultimately reached. The entelechy is the final end had in view by the exercise of an activity.

In tracing material through its transmutations from its

original state to its final purpose, there arise a succession of correlations, the terms of which are known as production and consumption. How these terms are used will be made clear by a few illustrations: Primitive man produces flint from the quarry and consumes it in making the arrowheads which he produces. With his arrowheads he produces rabbits; thus his arrowheads are said to be consumed when they are lost or destroyed, but there is still the production of rabbits from the wold, and this production is consumed as food.

The farmer purchases a tract of land covered with forest. The forest land he converts into a field; the forest he consumes perhaps for fuel, and the fuel is the product which he consumes for welfare, and the entelechy is reached. The field remains, from which he grows corn, and at the harvest the year's production of the field is consumed; but the corn remains as a product, which is material for the miller, which he consumes as miller's material by grinding it, thus producing meal; the meal is baked by the housewife, who consumes it as meal in producing bread, and the bread is eaten by the farmer's household and consumed, thus producing welfare, which is the entelechy.

The lumberman cuts logs in the forest; he consumes forest trees and produces logs; the raftsman consumes them at the place where they were produced and delivers them at the mill as the product of his labor; the product is the log delivered at the mill. The log is material for the miller, out of which he produces lumber; logs are consumed and lumber is produced. To the builder the product of the miller is material which the builder consumes in the product of his labor, which is a house; the domiciliary user consumes the house in welfare, and this welfare is the entelechy. Maybe the lumber is used for making furniture, then lumber is consumed and furniture is produced, and the furniture is consumed in the production of welfare, which is the entelechy.

The planter purchases a field on which he raises cotton; the time of the field, that is, its power of producing for a year, or, in other terms, the interest of the purchase money for the field for a year, is consumed in the production of a crop.

The labor on the field is also consumed, and the field of cotton is produced. Then the cotton from the plant is picked, and the field of cotton is consumed by the picking of the cotton bolls; the cotton now becomes the material for another process. Overlooking minor operations, it becomes material for the spinner, who makes a product of yarn; the cotton and the labor employed are consumed by the man who makes a product of cloth. Then the tailor consumes it as cloth, together with an amount of labor necessary to make it into clothing; then the clothing is consumed by the wearer, when it reaches its entelechy. Thus land, by a series of human processes through intelligent labor, produces welfare through a series of changes in which labor is consumed.

In the course of production from one kind to another and from one form to another, the domain of nature and art is ransacked for the purpose—air, water, land, plants, and animals are utilized and a multitude of persons are employed.

In the consideration of production we must contemplate the natural material found in air, in sea, in land, in plants, and in animals. The air is ambient over all the surface of the earth as a hollow sphere of gas. The sea has its gulfs, bays, and straits, with its auxiliaries in springs, lakes, and rivers, while the lower portion of the air is laden with moisture which is partially gathered into clouds and precipitated on the earth in rain when favorable conditions prevail. Thus the water is a sphere of liquid which intervenes between air and land. The sea with its auxiliaries yields its materials and the air yields its materials. Plants are scattered over all the surface of the land not covered with liquid water, and over a part of the surface of the land which is covered with liquid water, and over a part of the surface of the water, while animals inhabit the atmosphere and the watery envelope or hydrosphere. What is usually called the land is but the upper surface of a third sphere of solid rock which is denominated by geologists the lithosphere; this lithosphere contains another and important portion of the substances which are produced for the welfare of mankind. The lithosphere, the hydrosphere, and the atmosphere, together with the plants and animals of the earth, con-

stitute the environment of mankind. All human industries are therefore included in the consideration of the sources of the substances which men produce.

Hence, when we classify the substances of the environment in these five groups, we classify them in coordinate groups from the consideration of the environment of man, though we may afterward subclassify every one of these groups. We are not classifying substances into fundamental classes, but we are classifying the substances used by man into fundamental classes, and the subclassification will still include only the substances used by man.

Man is a denizen of the air; he lives on that portion of the surface of the lithosphere which is called dry land, where the watery envelope is vapor. Thus he is directly connected in his environment with the three spheres and utilizes them for his purposes. Man is not content with the natural products of the lithosphere, but he seeks to improve them. He is not content with the natural products of the hydrosphere, but he seeks to improve the water by purifying it or by charging it with other substances. He is not content to drink like the beast from the pool or the stream, but he seeks to bring the water to himself in the most convenient and best manner in which to enjoy it. Man is not even content with breathing the atmosphere, but he seeks to procure it in its purity, so he ventilates his habitation and otherwise secures the greatest purity. Man is not content with the plants as they are furnished by nature, so he improves them by cultivation and multiplies those which are useful to him and destroys those which are useless or injurious. Man is not content with the animals, so he improves them by zooculture and he destroys the useless and the injurious.

To designate those industries in which men engage for the purpose of producing kinds or substances, we need a technical term which will distinguish them from all other industries; for this purpose I use the word *substantiation*, which must here mean the artificial production of substances for human welfare. I have sought long and far for the best term. I may not have chosen wisely, but I have chosen with all the wisdom of which

I am possessed. It does not lie in the prerogative of another to reject my term when he attempts to understand my meaning, though it may be his prerogative to use another term when he desires to express the same meaning. If the distinction pointed out is a valid one, and useful for scientific purposes, a distinctive term is necessary; if the distinction is invalid or unfruitful to science, it may be neglected. Do not quarrel with me about my terms, but quarrel with me about my distinctions. If you decide that the distinctions are good, then accept my terms as they are used, still reserving the right to use better terms when you wish to set forth the same concepts.

In the transmutation of materials into products, the processes must be invented; but the product which is sought in manufacture may be but a small part of the material used. Metals are extracted from the ores, while the residuum is often valueless. Quinine is extracted from the bark of cinchona trees, and the product is very small compared with the trees. Sometimes secondary products are found still of value to mankind. From asphalt and other hydrocarbons illuminating products are manufactured, and from the substances which do not subserve this purpose aniline dyes are extracted. So by invention a multitude of substances are derived which serve human purposes.

Forever by art, substances are multiplied and their manufacture is specialized. (1) In modern culture man produces pure air by purifying it; (2) he produces pure water by purifying it; (3) he produces various substances by mining and metallurgy and other chemic processes; (4) he produces plants by plant culture, and (5) he produces animals by zooculture. Thus, the fundamental industries, which we here call industries of substantiation, are industries for the production of kinds.

Construction

The next class of industries in which men engage are those which are designed to modify the forms of things for use. Here we must call attention to the distinction which we make between *kind* and *form*. In popular usage these terms are interchangeable, but in science we must use terms with single

meanings; this is a fundamental requirement. The failure to observe this law opens the door to idle and vain speculation. We may find an illustration of what is meant by kind in ordinary enumeration and in the devices which men have invented to represent numbers. We have ten units as a sum; the ten units constitute but one ten, twenty units constituting two tens, and a hundred units constituting ten tens. The ninety-ninth is but one of the units of a hundred; it is but one in the last unit of the second order which constitutes the hundred. Counting is fundamentally determination of kind; and counting, like classification, is first determining a kind and then seriating the kind to obtain the class. I wish to count the horses in the field, and I must first distinguish the horses from all other kinds in the field and then enumerate them. This is counting. But if I distinguish the kind of horse and include them all as horses, I thus include all of this kind in nature. The difference between counting and classifying exists solely in the nature of the series which we consider. I invariably use *kind* in this sense and in no other.

Form signifies figure and structure, and implies the relative position of the parts which make up the whole. This distinction which I make between kind and form must be held permanently. You must not fall into the habit of confusing the terms as is done in common speech. In science we must use form to mean one thing and kind to mean another, and unless we adhere to this it is impossible to make scientific advance. Every man loves to use words as his neighbors use them, for speech is but a convention, and unless the convention is understood by others it is an unknown tongue; but no man has a right to demand of another that he use his words with the same meanings as himself if the other defines his meanings, and still less has he the right to demand that another should use a word with many meanings and thus obscure his language.

Man produces the clay when he digs up the kind of clay, or he may produce the kind of clay by mixing ingredients; but when he molds the clay into a brick he determines the form. He may mold the clay into a vessel; then also he determines the form in which it is useful.

Man produces forms of things that he may utilize air, water, rocks, plants, and animals. He utilizes air when he produces things that insure proper ventilation. A chimney is a form for this purpose; an opening in a room and a shaft in a building are forms of this character; a fan is a form designed to secure a better movement of the air.

For the utilization of water primitive man constructs a gourd into a drinking cup, or he moulds clay for the purpose of holding water, or he constructs wickerwork jugs for this purpose; so man digs wells and constructs reservoirs, and lays pipes for the transportation of water, and in higher civilization he constructs filters for the purification of water. Thus innumerable forms are constructed by man for the utilization of water.

In the same manner many forms are produced for the utilization of rock material. The rocks are built into houses as rock structures proper; the clays are molded into bricks or adobes to be built into houses. Iron is extracted from the rock and molded into innumerable forms for men's use. Copper, gold, and silver are in like manner produced as substances and wrought into forms which serve men's purposes for welfare.

Plants are used for fuel and wrought into forms that they may be utilized in stoves and furnaces. Plants are also wrought into forms of lumber and used in constructing forms: houses, furniture, vehicles, and ten thousand other shapes, that they may be useful to man; and many substances are extracted from plants to be wrought into forms. Many resins are used in this manner; indeed the forms produced from the product of the rubber tree that are useful to man are too great for enumeration.

Time fails me to tell of the innumerable forms into which animal substances are wrought for the use of man. But animal substances and vegetal substances have their grand use as food. The forms into which they are converted before they reach the entelic use are innumerable, but the subject is so often illustrated in daily life that to call attention to the fact is all that is necessary to our purpose.

In the production of entelic forms many ancillary forms are produced. These, perhaps, are so apparent that they need no further illustration; but the forms which are produced by man through industrial processes that serve the entelic purpose of welfare are innumerable, and when we distinguish them it becomes necessary for us to group these industries under one term in order that they may properly be distinguished from the industries of substantiation and from others which we have yet to consider. I shall therefore call them the industries of *construction*, as that term seems best to convey the concept. In late years there has grown up in science the use of a term which clearly sets forth the nature of the products of construction as the term is here used. This is artifact; the products of construction are artifacts. Construction, therefore, is the industry of producing artifacts, just as substantiation is the industry of producing substances. As substantiation is the art of producing substances from air, water, rock, plant, and animal, so construction is the art of producing useful artifacts from air, water, rock, plant, and animal.

Form and kind are concomitant. There can be no kind without form, and there can be no form without kind, and the distinction which we here make is but a distinction in consideration which classifies the industry. The world is concrete; but man's method of looking upon it is often abstract, and so his knowledge is ultimately built up into concepts of concrete things, which are first considered as abstract things when concepts of abstract things are utilized. All properties and qualities are abstract, but they inhere in concrete things. Concrete bodies and their abstracts as properties and qualities require abstract concepts for their cognition. Again must we recall the demonstrations of the pentalogic essentials of every particle of matter incorporated into the bodies of the universe. That there are five and only five of these essentials is the ultimate purpose of this discussion, and the ultimate demonstration must remain in view if we are to understand the nature of the argument.

Mechanics

In classifiying industries as those of substantiation or those of construction, we were compelled to use terms with specific meanings, and we selected the terms used because they seemed to be the most available for that purpose and because there seemed to be no terms in use for the industries which we wished to discriminate. Manufacture etymologically means "making by hand." In all industries the hands are used to a greater or less extent, and the term is used with this wider significance, so that its etymology and wider use alike forbid its employment to signify what we desire when we adopt the term construction. In the case of *mechanics* we have a term which is already used in science for the purpose we wish, signifying the industries which have for their purpose the utilization of powers.

The mechanical devices, as forms which are employed in the utilization of powers, are the hammer, the lever, the wedge, the wheel, and the pulley.

A hammer is a device for condensing the motion of a ponderable body through a space in a time and expending it in an instant; or it may be defined as the method of expending gathered momentum in the instant of impact.

A lever is an instrument which is used with a fulcrum to move a weight by taking advantage of the motion in an arc of a larger circle in the correlative arc of a smaller circle, so that the force of the long arm is expended in the short arm. A smaller mass is thus made to move a larger mass, but the smaller must move a greater distance. A hammer which is used for percussion is often supplied with a handle, which is a lever with a fulcrum in the edge of the hand. Thus the long arm of the lever is next to the hammer, and the momentum of the hammer is increased thereby.

A wedge is an inclined plane used to subdivide the distance of the weight moved into minute parts. The wedge itself is usually employed in conjunction with the hammer, the wedge being a device for subdividing the distance moved, and the hammer being used to take advantage of the force of percussion.

A wheel is a device for reducing friction, and the friction is reduced inversely as the perimeter of the wheel is enlarged over the perimeter of the axle. The wheel is variously modified for the reduction of friction.

A pulley is a wheel or succession of wheels so geared that the force applied must move over a greater space than the weight to which it is applied; hence a larger mass may be moved by a smaller, as in the case of the lever.

These forces—the hammer, the lever, the wedge, the wheel, and the pulley—are often combined in the same mechanism. Thus, in the screw, the lever and the wedge are combined, but the wedge is a spiral wedge. These fundamental mechanical devices are combined in a great variety of ways in the machinery of the industries.

These devices for applying power are sometimes called the mechanical powers, and the powers themselves are called forces.

Again I must remind the reader that there is no such thing as abstract power; it is always concrete, and its concomitants must always be considered when we consider real power as such. Power exists as an abstraction only in consideration.

Having considered the devices for applying power, we have now to consider them as they are utilized in tools and machines. A tool may be defined as an implement employed to utilize human power. A machine may be defined as an implement employed for using any other power than that of human muscle. The tool is dependent on the hand and is adapted to the use of the hand, while the machine is adapted to the use of other powers than that of the hand, though these powers may be directly or indirectly controlled by the hand. A flint may be fashioned into a knife on a grindstone supported by a wooden horse; the grindstone is a tool, but it may be run by water power, when it becomes a machine, for it must be provided with the apparatus necessary to utilize the fall of water. A hand hammer is a tool; but a trip hammer is a machine, for some other power than that of human muscle is used in its operation. The hand dasher in a churn is a tool; a power dasher in our modern dairies is a machine. The flail is a

tool used only by human power; the thrasher is a machine in which horse power or steam power is employed.

In the multiplication of processes, which we have already illustrated somewhat, many machines are employed in the manufacture of a single class of products. Often these machines are housed for their protection and for the protection of the laborers who are operating them. Such a group of machines with their houses is called a mill or a factory. In the mill many machines may be used, and many tools, all designed for the common purpose of producing a class of objects.

It now remains for us to set forth the classes of powers which are used by men to promote their welfare. These are muscular power, wind power, water power, heat power, and electric power.

Muscular power. This power is the primordial force used by mankind. It was used first as human power, but in the second stage of human culture animals were domesticated and used as beasts of burden. Especially is one animal used for this purpose, namely, the horse, and the power of a horse for a definite period of time, established conventionally, has come to be used as the standard of measurement for powers. Animals are used not only for carrying and hauling burdens, but they are used also for impelling machinery.

Wind power. Wind power is used to propel machinery and especially in the navigation of water to propel vessels, and the machinery devised for the latter purpose consists of masts and sails. In the early history of civilization the propulsion of vessels and the running of mills were relatively much more common than at present, and yet this power is widely used. Since air has been liquified it seems likely that this substance is to play a still more important rôle in mechanics, and that air is to become a commodity.

Water power. Water power is used chiefly for the running of mills. The tides as they rise and fall are utilized in their onward rush to impel mills by the construction of the necessary machinery, and the fall of water in running streams is utilized for the same purpose. Water is used also as steam to connect heat power with machinery.

Heat power. This power is obtained from the combustion of plants and animals and the hydrocarbon products derived from them. Steam is but a medium through which heat power is applied.

Electric power. Electric power is also a medium for transmitting wind power, water power, and heat power; but it also seems to be an independent power itself. Not being a physicist I am not competent to properly discuss this subject.

The whole discussion of mechanics may be considered as exceedingly elementary and to be but a simple exposition of common knowledge. It serves the purpose of this discussion all the better for this fact, for we are trying to exhibit the nature of the activities in which men engage for the purpose of classifying them and discovering how five properties of matter, and only five, are recognized in these activities, and for the further purpose of showing how they lead to five classes of emotions.

Commerce

The fourth great class of industries in which men engage for the purpose of obtaining welfare is *commerce.* Men do not produce substances everyone for himself, but everyone for others. They do not produce constructions everyone for himself, but everyone for others. They do not produce powers everyone for himself, but they produce powers everyone for others. The substances, artifacts, and powers produced are designed for the consumption of others; they thus become the materials for exchange, which are then goods.

Goods are produced, as we have already seen, by substantiation, construction, and mechanics, and there are other agencies which we have not yet considered. These products pass from one person to another in exchange before they are consumed as an entelechy. Every exchange implies a production and a consumption until the entelic consumption is reached.

The five properties of matter give rise to five elements of commerce, which we must now set forth. The first element of commerce consists of the goods or kinds of things which are exchanged. The second element is transportation, which

means the transfer of commodities from one person or place to another. The third element is the labor involved in making the exchanges. The fourth element involved is the money employed as the medium of exchange and measure of value. The fifth element employed is advertising, which is the method of informing those who desire goods for consumption that others have them and offer them in exchange for money. The five elements of commerce, therefore, are goods, transportation, merchandizing, money, and advertising. Every one of these elements of commerce involves activities—the activities of producing goods, the activities of transportation, the activities of exchange, the activities of finance, and the activities of advertising. They follow in this order from the nature of qualities which are derived from properties. Nature has established the order in which properties must be considered, for Nature herself considers them in this order. Now we have to consider the five elements of commerce severally for the purpose of considering the elements of which they are composed.

Goods. Goods are classified as esthetic, industrial, social, linguistic, and instructional.

Esthetic goods are ambrosial, decorative, athletic, gaming, and fine-art goods. These may all be reclassified in five groups. We have already seen[a] how the fine arts may be classified, giving rise to goods which are musical, graphic, dramatic, romantic, and poetical. In the same manner industrial, social, linguistic, and instructional goods may be classified and reclassified. Every value which man produces becomes goods, for in its production he expends activity, which is labor, and he receives in return for his labor the goods which he desires. In modern society the goods are obtained through an intermediate commodity—money—which is the measure of value and instrument of exchange.

Transportation. As men produce not for themselves, but for others, and receive money in exchange which they expend for themselves, the things which they produce must be transported

[a] Esthetology, or the science of activities designed to give pleasure, in Nineteenth Annual Report of the Bureau of American Ethnology, 1897-98, p. lv.

to the others. A man may produce an article which his next-door neighbor uses, and the transportation from one to the other is but an inconsiderable item. But the production may be a hundred or a thousand miles away; then the transportation becomes an important element in commerce; hence ships and railroads are constructed, and large bodies of men are employed in their construction and utilization. At first thought these industries along the great highways seem to absorb our whole attention, but on more minute consideration we find that the transportation of commodities for short distances is no inconsiderable item. Thus, the transportation of the bread, milk, and other items of trade through the streets of the city and the highways of the country, from the marts of trade to the individuals who are the entelic consumers, is of much relative importance. The transportation of commodities altogether will be found almost to vie in importance with the production of commodities by substantiation or construction or mechanism. We find that all of these operations are concomitant.

To the carrier, goods transported become freight. Goods and freight, therefore, are the same thing from different standpoints of consideration. In transportation we have to consider not only the freight but the substances, the constructions, and the powers employed in freighting, as well as the persons who direct the operations.

We must notice the correlation involved in transportation. In every transaction which involves transportation there is a producer and a consumer, and each party is both. The man who produces wheat is the consumer of the goods for which he exchanges wheat, so that there is correlative transportation. But the correlation is to some extent masked through the employment of money as a medium of exchange, for as goods are not exchanged directly, the correlation of transportation is in the first step the transporting of money in one direction and the transporting of goods in the other When credits are used as symbols of money, the correlation is still further masked. Wherever a man may be he has demands which must be supplied. Goods to satisfy these demands must be

transported to him, because he lives on the goods produced by other men which must be transported to him. The ultimate correlation is dependent on the equity of transactions.

There is still another phase of transportation that must be mentioned without stopping to fully set forth its nature. A man's wants may be supplied by transporting supplies to him, or they may be supplied by transporting him to them. No inconsiderable part of transportation is employed in transferring individuals themselves.

The substances that are employed in transportation are air, water, rocks, plants, and animals. The constructions that are employed in transportation are (1) those which are designed to utilize the air, such as ships that are impelled by sails and pneumatic tubes in which air pressure is utilized; (2) those constructions which are employed to utilize water for transportation, such as the steam engine and that machinery by which material is transported from one part of the mill to another by water power; (3) those which are employed to utilize wood, or coal (which is fossilized wood), for transportation; (4) those appliances which are necessary to utilize animal muscles for transportation, such as saddles, common road vehicles, and all of those articles which have become necessary when human beings transport freight; (5) all of the tools and machinery which are employed in the utilization of electricity for transportation.

Exchange or merchandizing. The man whose industry is buying and selling goods is the exchanger, and he regards goods or freight as commodities. Goods or freight thus become commodities to him, but the merchant has to buy his commodities instead of to manufacture them. The industry of merchandizing is therefore distinct from the industry of transportation, as the merchant is distinct from the mechanician who produces useful powers, or from the constructor who produces useful forms, or from the man who produces useful substances. The elements of merchandizing are buying, storing, exchanging, delivering, and gaining. In buying, the merchant must consider the wants of the people; in storing, he must consider preservation of the goods; in exchanging, he

must consider the value of the goods; in delivering, he must consider the distribution of the goods to his customers; and in considering gains he must consider the total cost to himself and compare it with the amount received, which may show profit or loss.

Money. This leads us to the fourth element of commerce, money, which, as one of the commodities, has to be considered as a value in relation to the other commodities, which are goods. Money consists of gold, silver, subsidiary coins, bank notes, and credits. In different stages of culture different articles have been used as money, such as shells, wampum, peltries, tobacco, and cattle; but in modern civilization the five kinds of money are almost universal.

It has always been considered important that the value of money should be permanent, so far as this can be secured by human agencies. If we consider long periods of time, this has never been accomplished. The device which the more advanced nations have adopted is to make either gold or silver, or both, at a fixed ratio, the measure of value, and then by statute to provide that subsidiary coins shall be issued by the government. It is provided further that bank notes should be made exchangeable with coin at the option of the holder who presents them for payment; but in modern times credits are very largely used in transactions, so that much of the money used in commerce is of this nature.

The business of the banker is the handling of money for a profit. He must therefore be a capitalist—must have money of his own—and the amount of money or credit of others which he handles, other things being equal, will depend on the amount of capital which he has invested either directly in banking or as security which it affords to the public in his transactions. In modern business much is transacted by credits, which are a kind of money, and the capital of the banker is held by his customers as either moral or legal security to them. The business man deposits money with the banker and draws it out on check from time to time as he uses it. A banker, having the deposits of many men, finds that he has in his custody a surplus of money which is more or less

constant. This surplus he lends at interest; he also lends his own money; his profits therefore come from the lending of money—either his own or the money deposited. The banker lends money to the public, but he is especially a lender of money to his depositors; thus, a merchant may deposit money by giving his note bearing interest, against which he draws by check.

Advertising. This leads us to the fifth element of commerce, which is advertising. In advertising, that which was first considered as goods, then as freight, then as commodity, then as value, is now considered as want. The merchant's business is to supply want, and it becomes necessary for him to inform the public of the goods which he offers for their supply. The method of giving this information to the people is advertising. The primal method of advertising is by the display of the goods themselves by the merchant or his assistants; no small proportion of the time of salesmen is occupied in displaying goods to purchasers. The second method of advertising is by the display of goods in conspicuous places, especially in show windows; this method of advertising has now become well-nigh universal. Show cases and window cases are arranged with deft hands in order to make goods attractive. The third method of advertising is with post bills, which are placed in conspicuous positions, on the walls of buildings, on fences, and by the wayside, or are worn on the backs of men. The fourth method of advertising is by the distribution, through carriers or by the mails, of handbills which are designed to inform the public of the character and prices of the goods offered for sale. The fifth method of advertising is the insertion of such business announcements in books and periodicals. Much of the advertising is now absorbed by the periodicals; the daily, weekly, monthly, and quarterly journals are to a large extent supported by advertisers who display in type the goods offered for sale, but the journals themselves are introduced to the public by the publication of news and the discussion of current topics, all of which are desired by the people.

Medicine

We have now to consider an industry which is designed to secure welfare for mankind in preventing, alleviating, and curing the diseases or other injuries to which men are subject. This industry is founded on the importance of securing the best opinions of men especially trained in the learning which pertains to sanitation and the remedies which are discovered to alleviate and cure diseases; it is especially an industry of opinions. Formerly this feature of the industry was somewhat masked by the more or less constant habit of medical men to furnish the medicines and appliances which they use, and to charge for the same rather than for their opinions. But this industry has been differentiated from medicine proper and is relegated to the apothecary, who supplies, as merchandise, the medicines and appliances, and the merchant obtains them from manufacturers who produce constructions and substances.

Here we have to note a peculiar habit of language by which the industry of medicine is called a profession. It will be observed that those persons who engage in the highest form of esthetic art, which we have called the fine arts, and who make a business of producing kinds of pleasure for others, are called professionals. In general, a professional is one who claims to be such an expert in his industry that he can command welfare for himself by the production of an esthetic commodity. We might stop here to show how the lawyer or the judge is also called a professional, but it will be sufficient for us to notice that the term is applied in common usage to denote a high degree of excellence in an industry, and that it usually pertains to those persons who engage in the fifth grade of arts, as we have designated them, namely, esthetics, industries, institutions, linguistics, and opinions. In medicine the professional medical man is remunerated, not for the medicine which he furnishes, but for the opinion which he gives.

Thus, in the order of arts which depend upon the properties, the fifth property of consciousness gives rise to a fifth industry of welfare, which we call *medicine.*

The subject of medicine is fundamentally controlled by the

five properties of human bodies and the organs which are developed severally for these properties. These are (1) the organs of metabolism or animal chemistry; (2) the organs of circulation or animal construction; (3) the organs of activity or animal locomotion; (4) the organs of hereditary genesis or reproduction, and (5) the organs of the mind or the nervous system. In order that the opinions of the medical man shall be of value, he must acquire a knowledge of the metabolic, constructive, muscular, reproductive, and nervous systems of the human body. This is fundamental.

Here it may be well to call attention to the organs of circulation, in order to show that they are organs of construction, though motion is involved therein, for the properties are always concomitant. When we consider circulation we are considering it as the placement of the erythrocytes which are brought to the parts where they enter into construction. We are not considering the power by which circulation is accomplished, nor are we considering the motion of the particles as trajectories, but we are considering the constructive result which arises therefrom, together with the result which is produced in removing waste material. We are not considering how the removal is accomplished, but the results of the accomplishment.

For the sanitary knowledge which he must obtain, the medical man must acquire a knowledge of the substances which men use in continuing life on this planet—air, water, rocks, plants, and animals—and how they are kept pure from deleterious substances or conditions. This function of the medical man is of modern origin, and belongs solely to the scientific period of medicine. We have to thank the medical profession for a vast body of scientific knowledge relating to this subject. It is the glory of the profession that its most arduous labors, its greatest scientific discoveries, and its most enthusiastic pursuits are devoted to sanitation.

Remedial medicine has a long and interesting history. We have already seen, in the account given of esthetology, how the fine arts are involved in the superstitions of mankind when they also play an important rôle in the religions of the world. Now we have to see how these superstitions control the practice

of remedial medicine. In every early society there is used a word which has the significance of "priest" as well as "doctor." The word "shaman" has come to be used as the representative of such words. We have already seen how esthetology was emancipated from religion. We must now set forth how medicine was emancipated from religion, for in the earlier stages of culture, when the opinions of mankind were mostly superstitions, religion essayed to control all human activities, and the priest was the dictator in every field of life; especially was it true of all those tribal and national organizations in which the head of the ecclesiastical body was also the head of the political body, and thus church and state were one. How this state of affairs originated we can not here set forth in any adequate manner, but we are compelled to refer to it in treating of the subject of medicine, and to make a brief characterization of the nature of early remedies.

Here we must set forth the doctrine of what I shall call *imputation*. Imputation is the practice of erroneous attribution, as of effects to wrong causes; for example, when I impute the pain which I feel in my head to a spell which has been wrought upon me by a witch. A superstition is an opinion which a man may hold by reason of imputation.

Now, we are briefly to consider how this practice originated. Savage men always impute mind, or organized consciousness, to inanimate things, such as plants, rocks, the phenomena of water, and phenomena of the atmosphere. They also impute mind to the heavenly bodies, which they suppose to be bodies in the tent of the sky, which to them is the great wigwam of this world. If the savage strikes his foot against a rock and seriously wounds himself, he does not attribute the accident to his own carelessness, but he imputes it to the rock itself, as being designed by the rock in order to injure him. Thus motives are assigned to all inanimate things, and events are believed by him to be brought about by others (animate or inanimate) which in fact are due to his own activity. This is the fundamental phase of imputation.

Then tribal men believe that mind, which is a property of animal bodies, is a property of all bodies, and that this prop-

erty is not a concomitant of the body and inherent in the body itself, but that mind is independent of body and can live apart from it, and when the mind leaves one body another mind may take up its residence there. This is the doctrine of ghosts as free, independent, and wandering minds.

There are many phenomena which to the savage mind lead to this opinion. I may briefly mention them: The phenomena of dreams, where men seem to go out of their own bodies and wander about the earth; the phenomena of ecstasy, produced by excessive mental or physical activity, where men seem to have visions of other times and places or to hear voices which do not speak in their ears; the phenomena of hypnotism, where men seem to see scenes which are not naturally presented to the hypnotized person; the phenomena of intoxication, where men believe they observe that which bystanders know to be not true; the phenomena of insanity, where the diseased person has thoughts which are erroneous, in which case the savage believes that the ghost of another has taken possession of the invalid. The doctrines derived from these sources seem to be confirmed to the savage mind by the phenomena of shadows and especially of echoes. Hence, in tribal society a ghost life is held in universal belief. Thus to imputation is added the ghost theory, or spiritism.

The savage man imputes the diseases which afflict mankind not to the bodies with which he peoples the world, but to the ghosts of these bodies. Hence we often find in a savage tribe that diseases are classified in a more or less vague way as the diseases of the stars, the diseases of the waters, the diseases of the rocks, the diseases of plants, and the diseases of animals. He does not consciously classify them in this manner, but he imputes them to the ghosts of these objects. When a patient is examined by the medicine-man, he may affirm that he has the elk disease, the bear disease, the wolf disease, the rattlesnake disease, or the green-snake disease, or he may say that he has the spider disease, or the fly disease. Especially are animals selected as the authors of ailments. I once witnessed the treatment of a child by an Indian shaman who claimed that its ailment was due to a little fossil abundantly found in

the carboniferous rocks of Colorado, and known as *Athyris subtilita*. I have many times known colds to be attributed to insects, toothache to be attributed to worms, rheumatism to be attributed to snakes, fevers to be attributed to birds; but on careful examination I have often found that the bodies of these things were not held to be the authors of the mischief, but that their ghosts were the active agencies. Not always can this explanation be obtained, and sometimes the thing itself will be exhibited as having been extracted from the patient; but, in the case of the *Athyris*, the medicine-man asserted to me that, when he extracted the disease from the child, he put the fossil in his mouth before he performed the act of suction by which the ghost was extracted, and that his office consisted in extracting the ghost from the child and returning it again to the body of the fossil.

It may be worth while for me to state how widely prevalent is this doctrine of disease among the North American Indians. I have found it myself among many of the Shoshonean tribes, which occupy a large area in the western portion of the United States; I have found it among the Wintun of California and many other tribes of the Pacific slope; I have found it also among the tribes of the Gulf states, and have never failed to find instances in any tribe in which I have made diligent inquiry. Such causes for disease, however abundant they may be, must not be considered to be universal as they appear to the savage mind. The tribes of America seem rather to prefer to ascribe their evils to their enemies within the tribe, or still more often to their enemies in other tribes, for of course they believe in witchcraft. Especially are epidemics imputed to hostile tribes. The theory of the action of their enemies seems to be somewhat of this nature: That the shamans of the enemies have control over disease ghosts. But enough of this phase of the matter here.

In barbarism, which is the upper stage of tribal society, the theory of disease undergoes marked development; not that imputation is abandoned, not that ghosts play a less important rôle, but that a new group of mythologic beings is developed. These mystic personages are personified phenomena of nature

which exist as divine personages, partaking in the affairs of mankind. While the hosts of savage mythology still exist in the popular mind, the leaders lay more stress on the doings of these nature gods. The nature gods are supposed not to be pure spirits, but have a celestial home where they habitually dwell and where they are organized into a tribe of their own. Now, the same characteristics of imputation are found, the same ghost theory prevails; but in addition there appear a host of nature ghosts which also take part in the affairs of mankind by assuming the shapes of men and representing them on earth. These new deities play a special rôle in producing diseases among mankind, and their assistance is invoked to prevent and cure disease.

In a higher stage of culture, when tribes are organized as feudal dependencies about city governments which are ruled by tyrants—which I have called the monarchical stage of society—there occurs a marked development of the agency of the stars in the affairs of mankind, especially in determining good and evil, and still more especially in determining the state of health and the condition of disease observed on earth. Thus astrology is held to be the ranking science of the world. In this stage diseases are imputed to the stars and to their position, especially at nativity and in other important epochs in the lives of individuals.

Perhaps we have already said enough about the theory of diseases antecedent to scientific medicine. We now must consider briefly the theory of remedies which prevails in the savage, barbaric, and monarchical stages of culture.

In savagery, men find their remedies as they are revealed to them in dreams, ecstasy, hypnotism, intoxication, and even in insanity. In every savage tribe there are particular ceremonies and other means instituted by shamans for the purpose of invoking these aids to diagnosis, and especially of appealing to them for the discovery of remedies. The ceremonies which the medicine-men perform by themselves for the discovery of remedies can usually be distinguished from those which they perform over their patients to secure the proper action of their

remedies. In the one case ghosts are summoned to reveal the difficulties; in the other case the ghosts are commanded, abjured, begged, threatened, and in various ways induced to leave the body by ceremonial processes. But the shaman, to become such, must first drink his black medicine; he must summon his tutelar ghost by fasting and feasting and by dancing or by long and intense contemplation, by one or another or all of the agencies for opening the portals of ghost-land; and when the gates are ajar he communes with the spirits. Thus medical lore is acquired in these stages of society by dreams, ecstasy, hypnotism, intoxication, and even by insanity.

There are other methods of learning the potency of remedies. There springs up in savagery a body of occult learning which is a doctrine of signatures, which comes down to the present time. Plants that have red juices act on the blood; plants that have heart-shape leaves act on the heart. In like manner all forms or fancied resemblances of plants and animals have a significance to the shaman as indicative of their medical potency. The world is ransacked to discover these wonderful things which can not help but reveal their use to the shaman eye.

In early civilization the chemical transmutation of things seems to excite the greatest wonder, which leads to the development of a rude chemistry of transmutation. This new chemistry is alchemy, and the discoveries of astrology are met by the discoveries of alchemy. In this stage of culture, astrology and alchemy prevail as the lore of medical science, which is characterized by the emblems or signatures as they appear in astrology and alchemy. Could we enter into the subject we could show how the potency of words or of formulas is now held to be of supreme moment. As poetry is now the fine art of allegory, so medicine is now the healing art whose lore is taught in allegory. When science comes, the art of medical remedies is emancipated from the art of alchemy, astrology is divorced from diagnosis, and the shaman becomes either a priest on the one hand or a physician on the other. Thus religion and medicine are divorced. But neither religion nor medicine is at once freed from superstition. The progress

is slow, and forever there is a war in both departments between science and superstition. How long, oh, how long will it last!

We return now to the consideration of scientific medicine, merely for the purpose of classifying the science, for we are in quest of the evidence by which we desire to exhibit the facts relating to the five properties of matter, and to show that the sciences are legitimately classified by considering the leading properties in a science as the characteristics of that science, and then to see if such classification warrants the conclusion that there are but five properties of matter, and that in every body these five properties appear.

In medicine we are attempting to show that the fundamental property on which the science is founded is consciousness, from which are derived the opinions by which physicians serve their fellow men to secure their welfare. We have tried to show that these opinions require a special study of the metabolism, anatomy, physiology, reproduction, and nervous organization of the human being. In addition to this, there is required a special study of the environment of mankind—the environment of air, water, rocks, plants, and animals, including human beings, by which the individual is surrounded. We might have resolved the immediate environment to more remote conditions in the universe, but have contented ourselves with the immediate or proximate environment rather for the purpose of showing that it is not necessary to make a final resolution of bodies and relations in order to discover pentalogic elements, although such elements appear whether proximate or ultimate conditions are viewed.

The physician must be informed not only about the conditions of health in these realms of environment, but also the conditions of disease in the same realms, in order that he may properly advise his patient for the benefit of his sanitation, or that he may prescribe those remedies which are best adapted to allay the evil effects of his environment For this purpose he studies the etiology or cause of disease. He must first study the disease itself in its symptoms, and then discover the origin of the disease in unfavorable conditions. We may pass over the study of symptoms, and the classification of diseases

themselves, for here we might antagonize contending pathies. Perchance, if I were quite honest, I would confess my inability to treat the subject as a medical expert. Then the physician must be versed in the causes of disease, and he discovers these causes in air, water, rocks, plants, and animals. Now, we might reclassify these agencies of disease, but the discussion would lead us too far from our theme, for we are not writing a medical treatise, and it might lead us too far from our knowledge. Then we are immediately led to the discovery of remedies, and here again we strike upon the pentalogic substances which are employed as remedies, and show how substances, forms, forces, causes, and concepts are employed as remedial agencies. Here again we must stop, lest we enter into disputation and show our ignorance.

SOCIOLOGY, OR THE SCIENCE OF INSTITUTIONS

Introduction

An institution is a rule of conduct which men make by agreement or which is made for them by some authority which they recognize as such. Many, perhaps most, of these rules are of great antiquity and are observed as customs, but new rules or modifications of rules are instituted from time to time as the exigencies of society demand. Thus, an institution is a recognized law of conduct devised by men. Law and institution are often synonymous terms. We use the term law from the standpoint of considering the rule; we use the term institution from the standpoint of considering the origin of the rule. I prefer to define sociology as the science of institutions rather than as the science of law, because in sociology I wish to include a study of the law itself and also a consideration of the manner in which it originates and the agency by which it is enforced, whether by sanctions of interest, sanctions of punishment, or sanctions of conscience. The term law itself has a wider significance than that in which I wish to use a term here. Law is a general term signifying not only the law of man, but the law of nature, and I wish to use it in this broad sense. I choose the term institution to designate the law made by man; but this term is often used with a broader signification than that which I desire—thus, an institution may be an organized body of men, or it may even be the name of a building. We sometimes call a well-known organization of men the Smithsonian Institution, and we sometimes call the building where they carry on their operations the Smithsonian Institution; but I here use the term institution to mean the rules of conduct instituted by men for the regulation of society, and do not include the material things which they produce by their industry.

When we examine the subject-matter of any treatise on sociology we usually find it dealing with the laws or institutions by which conduct is governed, and with the attempt to enforce these laws by governmental, moral, customary, ceremonial, and fashionable sanction. I use the term sociology to distinguish one of five coordinate sciences, esthetology, technology, sociology, philology, and sophiology; and I call all of these sciences demonomy.

I classify the sciences of sociology as *statistics*, *economics*, *civics*, *historics*, and *ethics*, and shall attempt to characterize them for the purpose only of setting forth their nature. I shall not extend the discussion into a treatise on the sciences of sociology severally, my purpose being classification only; for the end in view is to exhibit the logical necessity of making a pentalogic classification of all the sciences of demonomy in order that I may set forth the nature of qualities and how these qualities are founded on the universal properties of substances, having in view still another purpose, which is to classify and characterize the emotions. Pleasure, welfare, justice, expression, and opinion are concomitant; one can not exist without the other, hence there can be no sociology without esthetology, technology, philology, and sophiology.

We must now explain why we put sociology third in the order of demotic sciences. In industries we discuss natural forces under the rubric of mechanics, but we discuss only the forces not human—we consider only those of the environment of mankind, or those which exist in the air, water, rocks, plants, and the lower animals, and consider how they are developed from natural conditions by devices of control. In sociology we consider human forces exhibited in activities which ultimately arise through metabolism, so that men control their own actions or conduct in obedience to their judgments of good and evil. Thus sociology is the science of the control of human activities, not by mechanical devices as in mechanics, but by institutional devices. As the order of properties and qualities has already been established, and motion or force found to be third, sociology is consequently third in the demotic sciences.

Statistics

Statistics is the science of the enumeration of human beings and the material things which they produce. Here we have to consider what is meant by enumeration or counting. First, counting is determination of kind, then it is the determination of the number of the kind. Classification consists in determining the kind and in considering all of that kind in giving it a name; but enumeration consists in considering that series of a kind which is determined by some human purpose. The conventional series is always considered in conventional numbers, while the natural series or class is all of the kind.

Kind and form are concomitant, and thus forms may be counted, but usually such counting would lead to unwieldy, impracticable, or even inconceivable numbers; hence representative numbers are devised. The device used in reducing vast numbers to practical numbers is measurement. We do not count the grains of wheat, but we measure them in bushels. We do not count the blades of hay, but we measure hay in tons. We do not count the drops of molecules of wine, but we measure wine in gallons or by some other unit. Thus, measurements are adapted to the state in which the article exists, as gaseous, fluid, or solid, and the units of the different states are made commensurate.

Animals may be counted without measurement, but they also may be measured; the method of measuring them is by weight. Other methods adopted in statistics for measuring forms is the measurement of spaces; but in weighing, a force is measured—the force of gravity. This method of measuring does not give units in terms of motion, but units in terms of one mode of motion, which is gravity; therefore the units are in terms of force. There are other units of measurements devised in the arts, as for example those for light, heat, steam, electricity, etc., but we will not consider them here.

The common units of measure are units of space or of gravity. Governments prescribe the units of measurement in the interest of justice, and the instruments of measurement are regulated by law and kept under government surveillance.

The unit for the measurement of values is of gold or silver, one or both; in the case of both, the ratio is established. These units of value are coined in pieces as forms, and the government stamp gives warrant to the correctness of the amount of metal which they contain. If the Government guarantee also their relative value, questions of great importance arise, and these create political policies. If the Government coins only for itself, and purchases the metal which it coins, it matters not what the ratio may be. If it coins at a ratio which is not the market value of the metals, the more valuable metal at the ratio adopted will give value to the coins of the less valuable metal, and both classes of coins will circulate at the value established by law. If the mints of the Government are free to coin both metals for the public, and the legal ratio differs from the market ratio, the metal of lesser ratio value only will be offered for coinage, and the coins of the metal of greater ratio value will be driven out of circulation. Thus, in considering measurement of values many questions arise which are supposed to bear on the prosperity of mankind and especially on the people of a nation.

But why are statistics collected? The statistics of population in the United States are collected as a government function either by the nation or by the state for the purpose of fixing the basis of representation. Membership in the national and state councils is apportioned on the basis of population. The statistics of population, therefore, under our form of government, are necessary, for they are used as a basis for national and state legislation. School districts must have an enumeration of the children of school age who are to be provided with schooling facilities. The county must have an enumeration of the persons who require charity that it may provide for their assistance. If the state builds an asylum for the blind, it must have the number of the persons to be entertained therein. Statistics are required by all sorts of business enterprises in order that men may act with intelligence. Thus a life-insurance company bases its rates of insurance on tables of statistics which show the probable average duration of life from the age at which the insured persons sev-

erally applied. All intelligent action in business enterprise is dependent largely on accurate statistical information. This function of statistics we will designate as the function of information.

Statistics are compared for different conditions to exhibit important relations of social life as causes of good or evil effects. The comparison is made of numbers taken at different periods in the history of a people for the purpose of exhibiting the evolution of social conditions. This leads us to the consideration of statistics in verification.

So common is this use that it would not be a bad definition to say that statistics is the science of the verification of sociologic inferences. The statesman, whose vocation is the study of practical government, deals largely with statistics, and the sociologist, whose theme is the social structure and its functions, resorts to statistics for the verification of his doctrine. In this use of statistics the greatest care is necessary in order that unsound doctrines may not receive apparent confirmation.

We may assume that kinds are properly discriminated, that measures are reasonably accurate, that enumerations are well taken, and that comparisons are wisely made. There yet remains a large field in the use of figures in verification in which they may be perverted to the sustaining of fallacies. This is the field in which they are habitually used to verify theories of social evolution. Perhaps the most potent sources of such fallacies are the use of figures for comparatively short periods of time which do not admit of the elimination of transient causes, and the proneness of men to look at causes in the interest of parties, sects, and social classes, and to impute false causes to such social conditions as they may lament or admire.

This brief discussion will perhaps suffice to set forth the elements of statistics, which must be considered as integral parts of the science. To understand statistics it is necessary to understand the science of kind, the science of measurement, the science of enumeration, the science of comparison, and the science of verification, as they are represented in the science of statistics.

Causes are multitudinous. Much of demotic invention is exercised for the purpose of discovering the particular cause most easily modifiable in the interest of human purposes. In the multitude of such devices the causes are examined in a multitude of ways by a multitude of people who naturally seek verification for their inferences as to the best methods of modifying causes. In sociology this verification is by statistics, and any arrangement of figures which appears to verify an hypothesis may easily be believed to indicate the true or modifiable cause of the effects considered.

In all the field of human thought there is no region in which verification is more important than in sociology, nor is there any field in which pseudo-verification entails more misery on mankind. Men may claim to verify their speculations about motors, and arrive at conclusions in which perpetual motions are supposed to be involved in mechanical constructions; but only the deluded persons themselves who are engaged in such enterprises as inventors, promoters, or capitalists, are deceived. But when social inventions which are supposed to accomplish "perpetual justice" are adopted by men as bodies politic, calamity for the multitude is the result.

Statistics are collected by governments in all their units as nations, states, counties, cities, townships or wards, and families.

Within the governmental organization there are many other bodies corporate, such as educational institutions, ecclesiastical institutions, and industrial institutions. Every body of people is interested in the statistics which pertain to its functions. These secondary institutions are hereafter to be classified.

We have thus found that the elements of statistics are *classification*, *mensuration*, *enumeration*, *information*, and *verification*.

Economics

When, on the frontier, a log house is to be built, the man who proposes its erection invites his neighbors to a house raising. The logs cut from the surrounding forest are brought to accessible places around the cabin site, and a yoke of oxen is made to drag them one by one into position for use. Four logs are placed on rocks as a foundation; upon these logs

others are placed by rolling them up on skids, and so log after log goes up and the house grows apace. That these operations may be conducted successfully, a man is needed to drive the oxen; then a man is needed at each corner of the structure to fit the logs together where they cross each other near the ends. On each side of the house skids are used upon which the logs are rolled. As a log goes up a man at each skid stands ready with a chock to hold it in place as it is moved up by intermittent advances, and the two men at the corners receive the log, manage the adjustment of its position, and with their axes fit the ends of one log into notches in another in such manner that the house is well tied together. The logs are usually too heavy to be handled by a few men, hence a number are necessary to put them up, especially after the house grows, when the logs must be lifted to a comparatively great height. Thus the pioneer who is building a house enlists the services of many men to enable him to accomplish that which he can not do alone. When many men assist in the work, every one doing a like part, their mutual action is sometimes called "solidarity" in political economy. When they assist one another by doing unlike tasks, as do the men who are managing the skids, and the men who are fitting the logs at the corners, and the men who are driving the oxen, their method of cooperation is sometimes called "division of labor." Hence cooperation is accomplished as solidarity and as division of labor.

For the purpose of cooperation men unite in associations, sometimes only for temporary purpose, but often for a more permanent purpose. When such persons unite for an indefinite length of time, which may be for years or even for generations, the association is known by a fiction of legal expression as a "perpetual person," and hence it is often said of some corporations that they never die.

In sociology a corporation consists of a number of persons who associate themselves for a common purpose to secure solidarity and division of labor.

Incorporation has its reciprocal in organization. When we affirm that a body of men constitute a corporation, we imply

that they are organized; if we affirm that they constitute an organization, we imply that they are incorporated. The same body of men constitute an incorporation if we consider the purpose of solidarity, or they constitute an organization if we consider the purpose of division of labor.

The body of a man is incorporated as a body; but the body itself is differentiated or specialized into organs, as the term is used in physical science; or its parts exhibit division of labor, as the term is used in social science. Thus three terms are used in the sciences to express the same concept—differentiation, specialization, and division of labor. In treating of sociology it would be better to use the term specialization of labor rather than division of labor, and the term integration of labor rather than solidarity of labor.

We must now show the distinction which must be made between social incorporation and organization and physical incorporation and organization. In man the many organs are incorporated into one body by mechanical or physical bonds. The man is composed of actually coherent parts, but a society is composed of individuals who do not physically cohere. They may be together at one moment but apart at another, and members of the social corporation may wander about at will, independent of one another; they cohere only in purpose; that is, they have a common purpose, which is that for which the body politic is incorporated. There is thus coherence in purpose, but not coherence in mechanical structure. Purpose is something which exists only in the mind. We may therefore say that social bodies are ideally incorporated, while natural bodies are physically incorporated.

Having noted that incorporation is integration, and that differentiation is specialization of parts, we have to note further that this organization and specialization is accomplished to control the conduct of the members of the incorporation in relation to the purposes for which the society is organized. This control of the conduct is control of the activities of the members; the control of the activities is the control of the motility of the members in coming together and in speaking at their deliberations, but the control of their motility is effected by

controlling their judgments. The individual members, every one for himself, control their motility, or, which is the same thing, their activity, by controlling the metabolism or affinity of their several members, so that pairs of muscles which are set in operation one against the other are made the one to contract and the other to relax. Thus, a physical control of the several persons who constitute a body corporate is ultimately resolved into the control of metabolism, which is the control of affinity. There is a physical control of the conduct of the members through appeal to their purposes, which may be resolved into the control of affinity of particles. With this introduction we are prepared to consider the science of economics.

Economics is sometimes called the science of wealth and its distribution. More fully defined, it is the science which treats of the nature of property, the accumulation of property as wealth, the use of wealth as capital, the use of wealth as investment, and the use of wealth as endowment, together with the relations of property, wealth, capital, investment, and endowment to corporations.

There are thus five elements for consideration in economics. First, property; second, wealth; third, capital; fourth, investment; fifth, endowment. Every one gives rise to a group of corporations. The elements will be considered first.

Property. We have seen that labor is human activity exercised for the purpose of producing welfare. In producing welfare industry produces property.

We have already shown that the wants of men are wants for pleasure, welfare, justice, expression, and wisdom. Then, we have shown that the wants of men for pleasure are supplied by esthetic arts;[a] we have also shown that the wants of men for welfare are supplied by industrial arts;[b] we are now attempting to show that the wants of men for justice are supplied by institutional arts; we shall hereafter show that the wants of men for expression are supplied by linguistic arts; and after that we shall show that the wants of men for wisdom are supplied by instructional arts.

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[a] Esthetology, or the science of activities designed to give pleasure, in Nineteenth Annual Report of the Bureau of American Ethnology, 1900, p. LV.

[b] See the previous paper, p. XXIX.

In all these classes of arts something is produced for consumption, and we have already learned that the something produced does not immediately reach its entelic purpose, but may remain in a state of disuse until an event of production changes it in some manner so that it may reach its entelic consumption.

During all these stages it remains as property. This is true of all property of whatever nature. Then there is much property which requires a long time for its consumption; for example, houses may remain to be consumed by a generation or even a succession of generations, but the houses are originally produced from substances which men produce, and a house may not be wholly consumed by the domiciliary user without the production of intermittent repairs. Land is not produced by man from original substances; it is only improved by man that it may be rendered more useful through the production of improvements.

We are thus led to understand the nature of property itself. It is something which serves men's purposes and which remains for a time more or less ephemeral in the possession of individuals, or of corporations, or even of governments, and may be exchanged from one possessor to another at any time while it yet remains; and its continuance in time is ended by the entelic consumption, except in the case of land itself, which does not cease with the production of one crop, but continues for the production of others indefinitely as long as proper cultivation is continued.

Men create property by producing it through labor; when produced to the entelic state it is consumed, yet it may remain in stages of production and also in stages of consumption. In any of these stages it may be accumulated.

The foundation of property is primordial appropriation from nature through labor. The tribal man who appropriates fish from the sea constitutes it property, though it may be of an ephemeral nature. Still, while the food may be ephemeral, there may be appropriated other substances of longer value; thus, he may take whalebone, which remains a longer time as property; if he appropriates animals from the forest, their

skins may be property much longer than their flesh. This appropriation from nature has been universal among mankind, and in its simplest form is always recognized as just.

But there come complications in the appropriation from nature which give rise to differences of opinion about the extent to which and conditions under which this appropriation may be carried on. By civilized man land is thus appropriated; this is absolutely necessary that he may make it useful. As he appropriates it by labor, the labor on the soil first produces a single crop. The labor of appropriating the land perhaps does not obtain its full reward by the first crop, but the labor for the first crop enhances the value of the land for subsequent crops.

All the land of the United States has been thus appropriated from nature—at first by individuals under grants from European governments, but since the organization of the present government it has appropriated the land and has either sold it again to individuals or allowed them to appropriate it for themselves by homestead settlement. But in assuming the ownership of the land the general government has invariably recognized the prior titles to the land inhering in the aboriginal tribes, and has purchased it from them by treaties, paying for the land by grants of money. The total sum thus granted is more than three hundred millions of dollars. The title of the Indians to the land was a title which arose out of a quasi appropriation of the same—not by improving the lands themselves, but by gathering from the land their food, clothing, and shelter; still, in some cases the natives cultivated patches of soil. But the ownership of the land by these seemingly imperfect processes was fully recognized by the government of the United States.

The title to the land obtained by appropriating it through the labor of improvement has always been recognized among modern civilized peoples. But there are other agencies which give the land value, not included in that produced by improvements. Land may have an ever-increasing value given it by extraneous conditions sometimes equal to or even greater than the interest on the investment as purchase money. The

interest on the purchase money may partly or wholly be paid by the sale of farm products. In whom should the increased value to the land inhere? Men are divided in their opinion about the just method of distributing these increments of value. Our purpose is not to discuss such questions, but to point out the nature of the problems which are involved in the study of economics.

Wealth. Here we have to note that the fundamental production of property is appropriation from nature by labor. The substance appropriated from nature becomes new property at every stage of production, as artifacts, powers, and goods. Forever the value of the property is increased.

Thus, property remains only as property which is consumed as it is obtained, but property becomes wealth as it is saved. Frugality is thus the foundation of wealth, though industry and enterprise may contribute. Frugality, industry, and enterprise may add to wealth, for wealth already accumulated may be used as capital to increase itself.

Capital. Property, which has become wealth, may now be considered as capital. Wealth may be used as capital in the purchase of machinery and the appliances necessary to the use of machinery, in the purchase of material for further stages of production, and, finally, in the employment of labor to aid in the industry of production. We have thus considered capital in its use in manufacturing. In the same manner we may consider it in its use in commerce. These cases are sufficient, perhaps, to illustrate the principle.

Investment. Capital may be invested in such manner as to produce more without the owner of the capital engaging in commerce or manufacturing or in any of the industries of substantiation which we have heretofore considered. But as capital is of value in all of these industries, and as it may be invested with others who wish to conduct them, the interest on the capital may go to the owner of the capital. Thus capital becomes investment. That which in one stage we call property, in another stage wealth, and in another stage capital, we here call investment, meaning by that pure investment for interest.

Endowment. And yet we are to see property and wealth and capital and investment assume a fifth form; this is endowment. Men are not all chiefly interested in the pursuit of physical welfare, and those most deeply interested have other purposes which they hold dear. The farmer may still be interested in his church and may be glad to endow his church; the manufacturer may still be interested in a library and be glad to endow a library; the merchant may still be interested in a college and may be glad to endow a college. So some wealth at last becomes endowment.

We have different stages of the same thing, and call these stages, severally, (1) property; (2) wealth; (3) capital; (4) investment, and (5) endowment. It would be convenient if we had a generic term to express these things. Let us call them all possessions.

In the terminology of jurisprudence the word possession is somewhat ambiguous when it is used to denote a holding as something distinct from ownership. Thus, a horse may be said to be in the possession of a man who has the right to use it because he has hired it, and its more permanent ownership may be in another man. The man who has hired the horse has a right to its use during the time for which it is hired, but the ownership of the property is said to still remain in the man from whom it is hired. Still further, a thief is said to be found in possession of property when it is discovered in his custody, but the possession is fraudulent or criminal. Taking the term in all its uses, possession seems to be the best generic term to signify property, wealth, capital, investment, and endowment. Here we need terms for a genus and its species, and select the terms as shown.

It is the nature of property to be consumed, and it becomes property only because it can be consumed; but ultimate consumption may be postponed, and often consumption requires time. In the same manner it requires time for production, and in modern industry it often becomes necessary that the materials of nature should undergo successive stages of production in different hands; so property exists in stages of production and in stages of consumption. Entelic consumption is forever in prog-

ress, and what it produced is finally consumed. Wealth is that which remains over and above relatively immediate consumption. Capital is that part of wealth which is used by its owners in gaining other wealth. Investment is that part of capital which is used by its owners in gaining other wealth as interest, while the capital itself is in other hands in order that it may produce property for these others. Endowment is that part of investment which is dedicated to perpetual purposes, which the endowers believe to be important to mankind and from which they do not expect gain for themselves. We call all of these things possessions.

Corporations

The several forms of possession which we have described lead severally to forms of corporations. We have already defined corporations and shown how a body of men may be incorporated by organizing for a purpose.

Assisting corporations. That form of possession which we have called property, in which the possession is held by the owner for consumption, gives rise to a class of corporations which we will call assisting corporations. They are necessarily temporary in their nature, but they are often organized. A group of forest men unite to make a circle hunt of deer, or a driving hunt of mountain sheep. Such a corporation would belong to this class. The instance to which we have already alluded of the men united to build a log house would be another example. In frontier countries the men of a community often unite to build a bridge across a stream, or they unite to work the roads, or they unite to burn the grass-lands that they may be more valuable for the production of natural hay. These instances will suffice to set forth the nature of what we call assisting corporations.

Partnership corporations. Two or more men unite by forming a partnership to carry on a business together. They combine their limited wealth with their common labor. Perhaps they employ assistance, but such assistance is ancillary to the object of the corporation. No further description is needed to set forth the nature of partnership corporations.

Creative corporations. The third class of corporations we shall call creative corporations. Here capital in larger quantities is organized, a company to operate the enterprise is organized, and the employees or laborers are organized, every one to accomplish some particular part of the work. It may be that a factory is built for the purpose of manufacturing shoes; in it there are many machines, each operated by a special expert, and all the operations are supervised by a foreman, or there may be a foreman and his assistant foreman. Modern industries present many illustrations of these creative corporations. First, there is an organization of capital; second, there is an organization of machinery; and, third, there is an organization of labor. This complicated organization I call a creative corporation.

Creative organizations have the effect of instigating the laborers to organize societies which are known as trade unions, of which something more hereafter. When employers organize, employees organize. Thus power offsets power.

Investing corporations. We have seen how capital becomes investment. Investment is for interest. But there comes at last a stage in which the investors themselves organize as stock companies, not for the purpose of operating industries, but solely for the purpose of investing, while other corporations carry on the operations. These I call investing corporations. They might, perhaps, just as well be called stock corporations.

Societies. We next come to that class of corporations to which endowments pertain; these are usually called societies.

It is manifest that each group of corporations which we have hitherto defined may be classified by the pentalogic qualities as those designed for pleasure, those designed for welfare, those designed for justice, those designed for expression, and those designed for instruction. Yet, if we were writing a treatise on political economy it would be necessary to deal severally with assisting corporations, partnership corporations, creative corporations, investing corporations, and society corporations, for there are principles of justice which specially pertain to every one of these classes. Thus, assisting corporations often assemble on the invitation of the person to be assisted, and whether

the invitation be heeded is wholly voluntary with the individual invited, and yet custom is almost as imperative as statutory law. Then there are special principles of jurisprudence which pertain to partnership corporations, which affect the responsibility of the parties to others, and the mutual ownership of the incorporators. In creative corporations the employees are more thoroughly differentiated from the proprietors, and the employees themselves are apt to organize trade unions, and the employers as corporations negotiate with the trade unions in important particulars. Again, in investing corporations the stockholders constitute a special body themselves, the members of which may not take a personal part in the creative corporations, although the members of the creative corporation may sometimes hold stock in the investing corporation. In these corporations the employees all receive salaries, but some are known as officers and others as laborers. In society corporations the purpose is usually to promote some desired end, the interest in which will continue for time indefinitely, as when schools are endowed or churches built. For present purposes we need not take up the classes of corporations seriatim, but need only indicate their classification by qualities.

Corporations for pleasure. A number of schoolboys wish to play ball. Two leaders are chosen, and each one selects his helpers and assigns to each a particular part in the game. He thus organizes a baseball nine, which is a corporation for pleasure. Nine men, with an additional number as alternates, are organized under a manager and play a game, not for the pleasure of themselves but for the pleasure of others, and receive from the others payment as a reward. The players may also take pleasure in the game, but their ultimate purpose is gain or welfare, so that it is welfare to the players and pleasure to the lookers-on. Whether the game is considered as a pleasure or welfare, provision must be made for rendering justice when disputes arise, and hence there is an umpire. Now, the persons assembled to witness the game take great delight in the skill manifested by the players. Their delight is not in the activity of play, but in the skill of those engaged in the play. At every moment as the play proceeds the

players must use judgment, and their success depends as much on their judgment as on the skill with which they express it. The observers also exercise their judgment, and have their opinions about the players and about the judgments of the umpire, and express these opinions in approbation or disapproval, and the crowd is boisterous with such expression. In this example we see that the five qualities are concomitant in the same game, but the controlling quality is pleasure, for pleasure is the purpose of the multitude who come to look on, and it is the purpose of the players to give them pleasure that they themselves may have gain.

This illustration is used to set forth the nature of demotic qualities and how some quality becomes a leading motive in demotic activities, while all the other motives remain ancillary. Purposes can not be dissevered from one another in concrete activities, but they may be considered separately; that is, qualities are concomitant.

It will be noticed that the players must be organized into a corporation, but the onlookers constitute but an aggregate of people, although they may be assembled in a dense crowd. They are not organized for a purpose, although they have the common purpose of pleasure.

Corporations for welfare. There are corporations to promote the industries of substantiation, such as farmers' clubs, organizations for agricultural fairs, stock-growers' associations, and mining associations. There are corporations for the industries of construction, such as corporations for manufacturing, or societies for the promotion of a special class of manufacturers, such as bicycle manufacturers, men engaged in manufacturing leather goods, men engaged in manufacturing iron and steel goods. Not only do the capitalists themselves organize into societies, but the laborers organize into societies; these are usually trade unions; thus the carpenters are organized, and the locomotive engineers are organized, and all varieties of labor may be organized in like manner.

There are many corporations to promote the interest of merchants, which are partnerships to promote solidarity and societies to promote division of labor. There are corporations

of publishers to promote common interest, especially in the gathering of news, the publication of which gives circulation to advertisements. I need not consider such corporations further; they are apparent on the suggestion.

Corporations for justice. All political party organizations are designed to promote and secure justice. Individuals may have other purposes, as advancement in political life, but the body of people who are thus organized have justice for their purpose.

All ecclesiastical bodies are organized for the establishment and promotion of the principles of justice, but it is rather the higher principles which are considered as ethical principles. There is another motive for ecclesiastical bodies, which is the wish to promote sound ethical principles supposed to depend on the acceptance of sound theological doctrines. But whatever the theory of ethics may be the ecclesiastical organization has for its purpose the control of human conduct in the interest of the principles of justice. We need but to mention these principles to see the verity of this statement. The principles or elements of justice are peace, equity, equality, liberty, and charity, for which all courts as well as all ecclesiastical bodies are organized.

Corporations for the promotion of expression. At first sight these incorporations may seem to be hopelessly involved with corporations which have knowledge for their purpose, but on more careful consideration it will be seen that schools, which perform the double function of organizations for knowledge and expression, are in practice clearly differentiated. Of course schools for expression can not succeed without considering the knowledge to be expressed, nor can schools designed for the increase of knowledge succeed in their purpose without considering how knowledge may be expressed. In America the differentiation is well recognized by the common practice of calling the elementary schools "grammar schools." In these grammar schools the primary object is expression; the ancillary object is thought to be expressed. The purposes can not be divorced, because expression and knowledge are concomitant; but we consider the primary object of the grammar schools to be expression. The teacher

who supposes that he can teach language without teaching the nature of the knowledge to be expressed will fail utterly. So that the teaching of language or expression resolves itself into teaching the best method of expressing judgments and concepts, and before expression can be taught the nature of these judgments and concepts must be understood, that knowledge and habit of correct expression may be inculcated. The organizations which are designed to secure expression are therefore the common schools of the country, or, as they are often designated, the grammar schools of the country, including the modern organization of kindergartens.

High schools, colleges, and universities consider the knowledge obtained to be their purpose, yet they do not neglect expression; in fact, it is only of late years that knowledge has become their primary purpose, and expression but an ancillary purpose. Originally such schools were organized for the study of the languages in which knowledge was buried, and their purpose seemed to be expression rather than knowledge.

Common schools are not the only corporations for expression; there are schools or clubs of oratory and many literary clubs whose function is to train in expression rather than to derive pleasure from literature.

Corporations for the purpose of obtaining knowledge. There are many corporations of this character, and to properly set them forth we must touch them with the wand of pentalogy. Classified in this manner, they become corporations for instruction in the knowledge relating to pleasure, welfare, justice, expression, and opinion. Thus fine-art schools are organized to promote a knowledge of the arts of pleasure, industrial schools to promote the arts of industry. We may pause here to note how the schools of industry are classified. (1) There are schools of substantiation, such as schools of agriculture and schools of mining; (2) there are schools of construction, such as schools of manual training; (3) there are schools of technology, which are schools of mechanics; (4) there are business schools, under various names, which are schools of training in commerce; finally, (5) there are medical schools. Returning to the principal series, we find schools of justice;

these are known as law schools. Then there are schools of expression, as we have already shown; finally, there are schools whose purpose is knowledge; these are the high schools, colleges, and universities. In addition to these there are many corporations designed to promote knowledge.

After this consideration of the subject we are prepared to give a new definition to the science. Economics is the science of the relation of production to consumption through the mediation of corporations.

Civics

In characterizing the science of economics we have set forth the nature of possessions as exhibited in property, wealth, capital, investment, and endowment; then we have set forth the nature of the corporations to which possessions give rise. Corporations are groups of men organized for a purpose. We have further set forth that these groups of men may be classified to correspond with the fundamental classification of the qualities. From the demonstration of this subject the reader obtains a more or less clear concept of the way in which human interests are involved, and the relations which men sustain to one another. Forever we learn that the individual is compelled to consider the interest of others. Cultured man inherits from the brute condition extreme egoism which the development of the arts is forever correcting. It is thus that the many individuals are incorporated into societies and finally into nations where every man is compelled to consider other men as partakers of his interest because he can not serve his own without first serving the purpose of his neighbor. This is the fundamental lesson taught by economics. Only a few men can obtain food for themselves—the vast majority must eat from other men's cribs. Only a few can wear clothing produced by themselves—the vast majority must wear the clothing produced by others. Only a few men can take shelter in domiciles built by themselves—the vast majority must live in homes produced by others. Every man is dependent upon others for his existence, and in infancy is dependent upon others for his preservation, and he

remains still dependent in old age. Passing beyond the primordial principles of welfare, we still find the individual dependent upon others for his pleasure; we still find him dependent upon others for his language, for no man has ever invented a language, and the language used by one man would be the language of a fool. For his opinions every man is indebted to others. None of the opinions of mankind could exist to-day without culture, and culture implies that human knowledge is derived chiefly from others and that language is necessary thereto.

The act of a man to seek his own interests regardless of the interests of others is a crime. In specialized society men must seek their own interests by promoting the interests of others. This is the law of political economy by which wealth is produced. Self-interest may blind men's eyes to their true relations to others in relation to property. The brutal self-seeking which is inherited must by some agency be thwarted, else others suffer and hence self suffers. Then, the passions of men blind their eyes, and their passions must be controlled.

By common agreement rules or laws for the government of conduct are established, and these established rules are enforced ultimately by punitive sanctions. As punitive sanctions become more and more certain, the resort to such sanctions becomes less and less necessary if some method is devised by which the contending parties may have their cases adjudged. This leads to the organization of government. Government is a scheme for providing an organization of the body politic which will lead to the settlement of disputes, with power to enforce judgment by punitive measures.

Civics is the science of government. Government is organized to promote and establish justice. There are five elements of justice, no one of which can be neglected if any other is secured, and at the same time justice is maintained. These elements are peace, equity, equality, liberty, and charity.

Peace. The fundamental principle of justice is peace, and primeval governments are organized to secure peace. There can be no pleasure without peace, and infractions of peace produce the most intense pain.

Equity. On further consideration primeval man learns that he can not secure peace without exterminating the causes of infractions of peace. Every example of a disturbance of the peace is found to be the effect of some cause, and tribal man speedily reaches the conclusion that the causes which disturb the peace are the inequities which spring up in society. Perhaps men quarrel over the distribution of the spoils of the chase, perhaps they quarrel over their wives, but every infraction of the peace is seen to be caused by some inequity, and the question is asked, "How can these inequities be removed?" So tribal men attempt their removal by instituting courts of justice that peace may be maintained between the members of the tribe. They further find themselves involved in disputes and wars with neighboring tribes, and they make it a rule, even in the most primitive society, that the tribe, not the individual, has the right to declare war, and this declaration must be made by the council of the people. After the council has decided upon war, individuals on their own initiative may make the war, but they can not engage in such war without the tribal consent.

We have seen that the incorporation and organization of social bodies is not fixed by juxtaposition of parts, but by purposes. Here we have to note that the equity which is necessary to the continual existence of social bodies is not equivalence of parts, as that term is used in physical science, but it is the equity of conduct. Equity, then, is the demotic term for equivalence. One man paddles the boat and another kills the game, but the gain is shared; this is equity, or equivalence of rights. While one party is hunting another party may be fishing; each party shares in the gains of the other; this is equity, or equivalence of rights. Still another party may be engaged in defending the whole group; all share in the protection, and all share in the food obtained; this is equity, or equivalence of rights.

Equality. Peace can be secured only if justice is maintained. That justice may be maintained, the entire tribal council must be consulted when it is assembled as a court of justice. The fundamental requisite for a decision of the matter in such a

council is the equality of the members who compose the organization. One man's opinion may weigh more than that of another; equality of opinion is absurd, but equality of voice or vote in the council is necessary. So primeval man discovers the principle of equality, and from the first organization of tribal society to the present time, human equality has been a principle of justice. That which masks the principle of equality in the councils of early nations is the idea which grows up in barbarism and becomes thoroughly established in early national society, that guilt or innocence can be established by supernatural methods, and that the judgments of the council or tribal court should be controlled by supernatural agencies, as by ordeal; and when at last a stage of society is reached in which the ruler of the people is also the high priest of its religion, then the principle of equality necessary to the establishment of justice is temporarily overthrown, for the man who can render supernatural judgment has supreme authority. The law of equality in demotic bodies is the law of equality in asserting judgments.

Here we note that the equality is not that physical equality which is fundamentally expressed in science as the law that action and reaction are equal, but it is the equality of opinions of justice in the tribal court, which may be resolved into equality of purpose—one man's purpose in rendering judgment must be equal to another's purpose in rendering judgment. They must be equal because the men have a common purpose in rendering a judgment.

We have noted how equality is masked or even overthrown when the ruler becomes a high priest. In modern society, as in the United States, when the authority of the priest is overthrown, equality is more or less masked, although it may exist. Here the body politic is a very large group of people occupying extended regions. The court is no longer the council and the court combined, but special individuals are selected to constitute courts, and individuals are selected to constitute councils. In these councils the members are chosen by equality of votes, and they become representatives of all the people. But the council itself may be composed of two

bodies—a senate and a house of representatives. The house of representatives is directly representative of the people by their votes; but the senate is representative of the people in the second degree—it is representative of state legislatures which are representative of the people of the state.

Representative government requires a comparatively high degree of intelligence. Experience proves that uncivilized people can not properly understand the nature of representative government and can not successfully take part in such government with equality of vote, for they desire to vote upon all measures themselves rather than for representatives to devise measures; they would return to the savage council rather than submit to the judgments of the representative assembly. In the history of the United States we have been confronted with this difficulty in the management of the savage and barbaric tribes who were found as indigenes. It has been found impossible to induce them to abandon tribal government and to take part in national government by representation. As they claimed the land by hereditary possession, and as civilized man claimed the right to use the lands for purposes and by methods which civilization demands, a conflict speedily arose between the aboriginal inhabitants and the arriving thousands from oriental lands. This conflict has continued to the present time.

Other nations having representative governments rule over subordinate peoples, who are not yet competent to take part in representative government, by the method of imperialism, as it has come to be called. In such cases the subordinate peoples are governed by rulers appointed by the central government, and the people are permitted to rule themselves by tribal government, subject only to the central authority. The ways in which this is worked out in practical affairs are very diverse.

Liberty. Tribal men having discovered something of the principles of peace, equity, and equality, soon learn an additional principle necessary to their establishment; this is the principle of liberty. Every man in the council who becomes the judge of the conduct of his neighbor must have liberty to express his judgment, whatever may be the judgment of others. When the council considers questions of common

action, such as the removal of the village, or a hunting or a fishing enterprise, everyone must have a vote in determining action, for all must take part in the enterprise. The humblest man in the tribe must have liberty to express his judgment and must not be subject to the dictation of other men; hence, liberty is recognized even in primeval society as essential to justice.

The liberty which men claim in tribal society is liberty of personal activity and the denial that such activity can justly be coerced by others. This remains in all stages of society; but in tribal government it pertains only to the members of the tribe. Alien persons may become slaves, and their liberties are not held sacred—a subject which we will hereafter consider.

When the offices of priest and ruler are consolidated, the ruler becomes not only the judge, but he also becomes the arbitrary ruler—not as one having authority to execute the judgments of a council, but as one having authority to execute his own judgments, for he who can act by divine right and as the vicar of the deity must be obeyed.

Charity. Still in primeval society men learn the nature of charity and incorporate that principle into the concept of judgment. Perhaps the principle of charity has a more lowly origin than in human society. It is fundamental in all animal life where the parent provides for its offspring. On the bisexual organization of animals it receives an additional impulse in the cooperation of male and female and in the sympathy and assistance which they render each other. The third principle of charity seems to spring up in human society when children render assistance to parents in their old age. In tribal society these three principles of charity are well recognized, and provision is always made in the law of custom which is enforced by the tribal council.

It remained for civilization to add two principles to the concept of charity. The first is individually acted on by tribal men, but seems not to be enforced by legal tribunal. It is the assistance which men render to one another in misfortune. In early civilization this took concrete form by the establishment

of charitable agencies, by the institution of laws for their maintenance and support, either by social bodies corporate or by governmental bodies corporate. In that stage of society in which church and state were still under one head, while the fusion resulted in the temporary overwhelming of liberty, it performed a royal deed for mankind by enlarging the concepts of charity.

The fifth principle of charity is the recognition that justice does not require punishment, but only remedy for the past and prevention for the future, and that man may not mete out vengeance. This is the crowning element of charity. The elements of charity may be stated as (1) care for the young, (2) assistance to companions, (3) provision for the aged, (4) help to the unfortunate, and (5) mercy to the criminals. We have now developed the concepts of justice and have designated them as peace, equity, equality, liberty, and charity.

The Departments of Government

The departments of government may be classified as constitutive, legislative, operative, executive, and judicative.

Constitutive department. A modern government may have a written constitution which sets forth the plan of government. Other nations have a system of habitual practice, modified from time to time as circumstances seem to demand, which is observed as the common law of the government. I wish to use the term constitutive government for one of its departments coordinate with the others which I will set forth. I desire a term which will signify the manner in which the officers of the government in all its departments are selected, chosen, or appointed.

In many governments the officers are such by hereditary succession. In other governments, as in the United States, the officers are largely elected, though provision is made for appointment even of certain important officers, while a large number of minor offices are filled in this manner. The persons who have the appointing power are persons who are elected to their offices and thus represent the people in their acts of appointment. Here different degrees of representation may be observed.

We wish to have a term which will signify the method by which the officers of the government are selected and the rules by which such selection is accomplished, and for that purpose I adopt the term constitutive government. I hold that this department of government is coordinate with the others to be explicated.

A representative government is one in which the officers of government represent the people. The manner by which they become representative must be in harmony with the third principal of justice, which is equality. All persons who constitute the body politic, and who acknowledge the government as authoritative and seek its protection from unjust encroachment, should have an equal voice, expressed by a vote, in the choice of the representatives of the people who perform the functions of the government.

In tribal government every person has a voice in the council, and the council is also the court. The chief of the council has but one vote like the other members, but he is also the leader of the people when they proceed to carry out the decisions of the council. Such a method of government is impossible in modern civilization, where the people are many and are scattered over a large region. So representative government is devised, in which few persons, compared with the whole number of the people, become the officers of the government, or, as they are sometimes called, the government itself.

This is in harmony with that principle of evolution which is called specialization, in which the functions of society are parceled among the people, so that one class of people may do one class of things for all. The experience of mankind in the evolution of society has resulted in an ever-increasing specialization of these functions.

In other departments of human activity the specialization is largely voluntary with the individual, and men become farmers, manufacturers, or tradesmen by their own will; but whether they become officers of the government or not depends not upon their own will, but upon the will of others whom they are to represent. In a high stage of culture the right to choose rulers is held of paramount importance. The wish to exercise

this right has led to the organization of representative government.

The impossibility of continuing to realize primitive justice and primitive equality by primitive methods has been more and more clearly demonstrated with the ages of advancing civilization. The savage is willing to be controlled by the voice of the people of the tribe, with every one of whom he is acquainted, and to every one of whom he is related by bonds of consanguinity and affinity; but under the new conditions of society, where the individual man may be unacquainted with the man who produces his bread as a farmer, or produces his shoes as a manufacturer, but upon whom he depends for the supply of his wants, he finds it necessary to organize representative government. All men in the nation are neighbors of every man, and to maintain justice with these neighbors representative government is devised.

Here we are interested in the consideration of how governments shall be made representative. This is accomplished by some method of constituting a part of the members of the body politic the agents of justice, and those who select representatives for this purpose are called their constituents. That department which I call constitutive government is the one that deals with the selection of the representatives of government in all departments.

Legislative department. This department of government is organized for the purpose of considering principles and determining methods by which society should be governed. It therefore enacts statutes of law. The modern legislature or parliament is the differentiated organ for performing one of the functions which was performed by the primeval council in primitive tribal society, while the other function—that of the court—is performed by another department of government. The relation between the constitutive department and the legislative department is pretty well recognized in the United States. We need not set forth the nature of the legislative department, as that is a subject upon which men in this country are well informed.

Operative department. The third department is pretty well

recognized in all highly civilized countries, although it is but imperfectly differentiated from executive government. I mean by operative government that department which is undergoing rapid development and which is the subject of much controversy at the present time in this and other countries. It is affirmed by some and denied by others that the government should operate the railroads. Already the government, in one or another of its units, constructs the common highways, but beyond construction and maintenance further operation is unnecessary. City governments construct and maintain streets and sidewalks, and some of these subordinate units provide and maintain the agencies for lighting the city. Most city governments provide water for domestic use. The nation, the state, the city, the county, the township, or the precinct provides for the establishment and maintenance of schools. On every hand there is a development of the operative functions of government. The distinction which we here draw is well understood by the people, and parties are divided on the question of the wisdom of the assumption of operative functions by the government. On one hand extremists affirm that only executive functions should be exercised, and that all operative functions are encroachments upon the rights of individuals. On the other hand extremists affirm that all the operative functions of modern society should be assumed by the government in the interest of justice. This characterization of operative government seems to be all that is necessary for present purposes.

Executive department. The executive department is primarily organized for the purpose of causing the statutes to be enforced. It is charged with the maintenance of peace and order in society, both in its internal affairs and in its external relations. It therefore consists, in its personnel, of the executive officers of the government, as presidents, governors, mayors, marshals, constables, and policemen, and in external affairs of the army and navy with all their multifarious personnel. Nowhere among civilized governments is the differentiation between the executive and the operative departments fully accomplished, though the distinction is well recognized.

Judicative department. This department of government is pretty well segregated or differentiated from the other departments which we have indicated. Two distinct branches of the judicative department are well recognized, the one branch composed of justices of the courts, the other composed of the advocates or attorneys of the courts, who practice before the justices in guiding the procedure, in marshaling the evidence, and in calling attention to the law and the principles of law which they deem of importance in deciding cases. This side of the court is employed in the support of the interest of the disputants, both parties being represented in this manner, while the justices of the court preside over the hearing and, sometimes with the aid of ancillary juries, render a decision. While the legislature is engaged in the consideration of the principles of justice as applied to the people at large, the courts are engaged in the application of these principles to cases which arise in dispute.

Having set forth the nature of the five departments of government and explained how they may be perfectly recognized and yet imperfectly differentiated in practice, we find it desirable to make some further comment in relation to the importance of complete differentiation in these functions. The founders of the Government of the United States were deeply imbued with the doctrine that the legislative, executive, and judicative departments should be thus differentiated, and it is often held as one of the crowning marks of their wisdom. When we consider the stage of differentiation of function which they found exhibited in the governments of the world, and consider their own accomplishment in this respect, it appears that a great advance was made in the interest of justice and the purification of political life. The fathers of the Republic were confronted by the very general, though not universal, opinion of mankind, that a republican government would fall by inherent weakness; so they adopted measures in the interest of stability of government which were inconsistent with the principles which they avowed. Again, they had to meet and harmonize the interests of diverse colonies, and were compelled to adopt what have since been called the compromises of the Constitution. For

these two reasons some things were embodied in the Constitution by its founders which their successors have deemed it wise to change. Among these may perhaps be placed their failure to differentiate the departments of government to such an extent as fully to carry out their principle, and the dream of representative government which we find depicted in the writings and speeches of the fathers of the republic has in part failed. But more: At that time the whole scheme of differentiation was but imperfectly understood. It may be that some radical work is needed, but the progress exhibited in the last decade of history gives warrant to the opinion that these changes may be made by evolution without revolution. It is now abundantly manifest that the government of the republic requires important changes in its constitutive methods. These methods should be revised and the constitutive functions fully differentiated. On the other hand, the division between operative and executive government requires immediate consideration; their union leads to corruption on the one hand and to injustice on the other. It is the opinion of the author that the great question in American politics to-day is to complete the differentiation of the departments of government.

A remark is here necessary. It is needful to discriminate between what I have here called the departments of government and the departments as they are known as offices of administration in the national union, as we speak of the Treasury department, the War department, the Navy department, the Interior department, and the Department of Agriculture. These departments do not correspond to the departments of government as herein considered.

Regimentation

Governments are organized into a hierarchy of bodies. These bodies are units of different orders. The people of the United States, with trivial exceptions which need not here be considered, are naturally constituted of families in which are involved duties and rights one to another. The families of a township or precinct or ward are organized into another body politic. Here we must note that town, precinct, and ward are

names of units of the same order, although the different terms are used in different sections of the country and under different conditions. The families which constitute the townships are also organized into counties. Sometimes a city embraces more than one county, but usually the people of the city and the people of the county are identical. The families of townships and of counties are organized into states. Here we adopt American usage in the names of the subordinate units of the nation. The people of the states are organized into the nation which we call the United States of America. Wherever the English language is spoken this nation is known as the American nation. In considering this organization we must clearly conceive of its units as a hierarchy of subordinate units in the national unit, and recognize that the nation is not something different in its personnel from the states, the state not something different in its personnel from the counties of which it is composed, the county not something different in its personnel from the townships of which it is composed, and the township not something different from the families of which it is composed, but that the people are organized in this manner by the territorial grouping of their domiciles for the purpose of promoting and securing justice, and that part of the social relations of the people are regulated by the agencies of the nation, another part by the agencies of the state, another by the county, another by the township, and another by the family. Thus rights and duties are parceled out among the units of governmental organization.

Over those relations which the nation controls, its organs are of supreme authority, but it does not control those relations which are relegated to the state governments, nor do the states assume to control the relations relegated to the counties, nor do the counties assume to control the relations relegated to the townships, nor do the townships assume to control those relations relegated to the families. At one period the differentiation between national and state government may differ from the differentiation which prevails in another period; but when this differentiation is changed, it must be done by a change in the written constitution submitted to the states sev-

erally for their ratification, in which case the constitutional majority, which is more than a plurality, must affirm.

We have spoken of the organization of this nation as an example, but all other civilized nations have a corresponding organization which varies in differentiation of functions, but the same hierarchy of units is usually to be observed. In the same manner it is necessary to consider that the differentiation of the departments of government varies from nation to nation throughout the civilized world, and that the principles of government which we have set forth as peace, equity, equality, liberty, and justice are differently expounded and applied to governmental affairs.

Historics

Historics is the science which records events of social life and shows the relation existing between social causes and social effects. A mere record of events is usually called annals, and furnishes the data for history. Only the history of peoples is usually called history, the history of individuals is usually called biography; but as we wish to include history and biography in the science which we are to characterize we shall call it historics, meaning that history and biography are included therein. We shall divide the periods or stages of social history into savagery, barbarism, monarchy, and democracy.

SAVAGERY

To the ethnologist a savage is a forest dweller. In common conception the savage is a brutal person whose chief delight is in taking scalps. Sometimes the sylvan man is cruel—but even civilized men are sometimes cruel. Savagery is a status of culture to the ethnologist, who recognizes four such stages, of which savagery is the lowest. Some of the Amerindian tribes belong to this lowest stage, while others belong to a higher stage which is called barbarism. Wishing to show my readers how a savage tribe is governed, I must at the outset ask them to consider the savage not as a man of cruelty, but as a man who takes part in a regularly organized government, with laws that are obeyed and enforced. What,

then, is a savage tribe, and how does tribal society differ from national society?

The nation, like the tribe, is a compound group of people, the distinction between them being in the method by which the grouping is accomplished. All the people of the United States belong to the national group. They are citizens of the nation, and, at the same time, are divided into 45 groups as citizens of states. In every state there are counties, and the people of the state are citizens of one or other of these counties. Then, again, the counties are divided into precincts, towns, or townships. Sometimes towns are divided into school districts, and cities into wards. And there are numerous villages. Thus the people of the United States are organized in a hierarchy of groups, from the school district to the entire nation. The territory of the United States is divided into subordinate districts throughout the hierarchy, and there are at least four groups in the hierarchy—the town, the county, the state, and the nation; or, the ward, the city, the state, and the nation. Every citizen of the United States, therefore, belongs to four different organizations in a hierarchy. He has a vote in each organization, assists in the selection of its officers, obeys its laws, and holds allegiance to its authority. This is all very simple, but the plan of grouping or regimenting people by territorial boundaries is of late origin. Our Anglo-Saxon ancestors were grouped by a very different method. History teaches that the ancient Greeks and Romans were grouped by a different plan. In fact, it has been discovered that, in the two stages of culture which I have called savagery and barbarism, a very different plan of regimentation everywhere prevails. This plan is known as tribal organization.

Tribal organization characterizes the two lower stages of culture, though savage regimentation differs from barbaric regimentation in some very important particulars.

In tribal society people are grouped or regimented in bodies of kindred. Let us first examine this grouping in the savage tribe. A savage tribe is composed of clans. Let us obtain a clear idea of what is meant by a clan.

A tribe is a group of people belonging to clans; a clan is a

group of people having a common name. Suppose that a tribe springs from four persons, viz, a brother and a sister belonging to one clan and a brother and a sister belonging to another clan, and that each of the men marries the other's sister. Let us call one of our clans "Wolf" and the other "Eagle." The Wolf man marries the Eagle woman and the Eagle man marries the Wolf woman. This is the first generation of a tribe composed of two clans, the man and his wife belonging to different clans. The four persons belong to two clans, and constitute two families. Let us suppose that each couple has four children—two boys and two girls. They will belong to two clans. The children of the Wolf mother will belong to the Wolf clan and the children of the Eagle mother to the Eagle clan, for the children take the name of the mother. This is the second generation. Then four people of the second generation and two of the first generation belong to the Wolf clan; and four of the second generation and two of the first generation belong to the Eagle clan. Thus we see that clans do not correspond to what we call families. The husband and wife belong to different clans; and the children belong to the clan of the mother, and take the name of the mother. The mother, not the father, owns the children; and the husband is but the guest of his wife, not the head of the household.

Suppose that each man of the second generation marries a woman of that generation who belongs to a different clan, and that each pair has four children—two boys and two girls. These children constitute the third generation. The children belong to the clan of the mother. There are now three generations of people in each clan; and every mother claims her own children as members of her clan. The head of the family is the mother; but the head of the clan is the grandmother's brother. Always the elder-man of the clan is the ruler of the clan; and the woman is the family ruler of her children. We may go on from the hypothetical beginning of a tribe through successive generations; and still the ruler of the clan will be the elder-man of the clan and will govern not his own children and their descendants, but his sister's children and their descendants. We may therefore define a clan as a group of kindred people whose kinship is reckoned only through females.

A clan always has a name, which is called its totem; and the object from which it is named is in like manner called its totem. Thus, in the two clans which we have considered, the wolf and the eagle are respectively called the totems of the clan. The totem receives great consideration in savage society. It is usually some beast, bird, or insect, or some important plant, such as the corn or the tobacco; or it may be the wind, the rain, a star, or the sun. The totem of the clan is considered to be the progenitor or prototype of the clan. The people of the Wolf clan claim to have descended from the wolf; the people of the Eagle clan, from the eagle; the people of the Wind clan, from the wind; and the people of the Sun clan, from the sun. The totem is also the tutelar deity of the clan.

There grows up about the clan a singular set of rules and observances which are rites on the one hand and prohibitions on the other. The prohibitions are usually called tabus. Thus, the members of the Wolf clan must not kill a wolf, as the killing of the wolf is tabued to the clan; but if they see one they must perform some ceremony. The rites and tabus of the totem are universal in this stage of society, and are held as sacred obligations. One of these tabus is especially to be noted: A person must not marry into his own clan. The tabu is sacred; and its violation is a horrible crime, which, in some tribes, is punishable with death.

An individual is likely to have as many kindred through his father as through his mother; and he is also likely to have as many kindred through his wife by affinity as through his father and mother by consanguinity. All those persons to whom the clansman is related through his father and through his wife, together with all the members of his own clan, constitute the tribe. Thus in savage society we have families, clans, and tribes. We have still a fourth unit. Two or more tribes may unite to form a confederacy for offensive or defensive purposes, or for both. When a confederacy is formed, artificial kinship is introduced; and the tribes which unite agree to consider themselves related. If two tribes unite, the men of the tribes may consider each other as elder and younger brothers, or as

fathers and sons, or even as uncles and nephews. Where many tribes unite to form a confederacy, relationships are distributed to the members of the confederacy, but only after long conferences, where such questions are considered in detail. Thus we see that in tribal society men are not regimented or grouped territorially, as in national society, but are regimented by kinship, real or conventional as the case may be; the same end, however, is accomplished in full, that is, the people are grouped in a hierarchy of units. Thus in tribal society men are grouped or regimented by kindred, and each person belongs to at least four groups of different grades in the hierarchy. Certain things are regulated by the confederacy, certain things by the tribe, certain things by the clan, certain things by the mother of the family. In national society there is local government. In a democratic nation this is local self-government; and in a monarchical nation it is local government through officers appointed by the monarch. In tribal society there is group government, the questions of government being relegated to the several groups, and the elder man of the group having authority.

In the course of generations some clans may die out, and the children be left without parents or grandparents: they must then be adopted into some other family. If they are adopted by a mother's sister they are still in the same clan; but if they are adopted by a father's sister they are considered as belonging to his clan, which is the same as that of his sister. It is thus that it sometimes happens that children change clans and, consequently, their totemic names.

When the men of a clan go out to hunt or fish, to make a boat or build a house, or to do any other work together, the oldest man of the clan is the director of the enterprise, the chief. All Indians hold that superior age gives authority; and every person is taught from childhood to obey his superiors and to rule over his inferiors. The superiors are those of greater age; the inferiors, those who are younger. It is the law of tribal society that superior age gives authority, and that inferior age imposes a duty. But the people of a tribe do not know their age, for they do not keep a record of time.

How, then, can they carry out this law? Well, they have a very simple device, by which every person in the clan may know that he is older or younger than other persons in the clan. Besides the totem name they have kinship names. Thus, there is a name for "father" and another for "son"; and the son always knows that he is younger than the father, and must obey him. Similarly the father always knows that he is older than the son, and that he has the right to command him. The same is true of mother and daughter. But there may be two or more brothers; so they have two names for "brother," one meaning "elder brother," and the other "younger brother." In the same manner they have two words for "cousin," one signifying "elder cousin," and the other "younger cousin." They have also two words corresponding to "uncle" and "nephew"; but the word meaning "uncle" is always applied to the elder, and the word which means "nephew" is always applied to the one who is younger. Thus in the Ute language there are two words: *ain* and *aitsen*. *Ain* applies to the one who is the elder, whether he be uncle or nephew; and *aitsen* applies to the younger, whether he be uncle or nephew.

So long as the tribesmen live together in clans they have a simple method of keeping in memory their relative ages: for the names by which they address one another always express the difference in age; and it is a law in tribal society that one person must address another by a kinship term. He may *speak of* another by his totem name, or by any other name; but he must *address* another by his kinship name. It is always considered an insult to call another person of the same body of kindred by any name other than his kinship name. A Caucasian boy on the street may call his brother "John," but an Amerind boy in the woods must call his brother by one of the terms which show that he is older or younger than himself.

The oldest man of the clan, having natural authority, according to Amerindian ideas, over all members of the clan, is their chief; and this is the basis of the patriarchy. A clan is said to have a patriarchal government.

Sometimes the elder-man or patriarch or chief becomes old and imbecile; or there may be another man in the clan whom they suppose to have greater ability, and they decide to make him the chief. In such a case the law is obeyed by a plan which lawyers term a legal fiction. The new chief is promoted; and then he becomes the grandfather of the clan. If his father is still living, he is compelled to call his chieftain son "grandfather"; if his elder brother is still living, he is compelled to call the chief "elder brother"; if his uncle is still living, he is compelled to call the chief "uncle." So, by this legal fiction, the chief is still the patriarch of the clan. Not only can a chief be promoted to the head of the clan, but from time to time different individuals in the clan are promoted over their fellows. A young man who proves himself to be skillful in fishing and hunting, or a brave warrior, may be promoted over his fellows, who thus become persons younger than himself and must address him as if he were older. Every year adds a new spike to the antlers of the stag. Some Amerinds call such a promotion the adding of a spike to a man's horns; other tribes speak of it as adding another stripe to his paint; and still others, as adding another feather to his bonnet. Sometimes a chief may prove to be a coward; then he will be deposed. Or an individual may disgrace himself, when he will be reduced in rank. When a man is deposed the Amerinds will say that his horns have been knocked off, or that his paint has been wiped off, or that his feathers have been plucked.

In a similar manner tribes and confederacies are governed by reckoning kinship in different ways and making kinship by legal fiction. All such governments are patriarchal. It will readily be seen that such government is not possible in civilized society. What man can know the names of all the persons living in a county or a state, or who can learn all the names of the people who live in a city, and how can one trace out the kinship of the people of a city into clans? Tribal society, or kinship government, is therefore impossible in civilization, and is possible only where the group of people thus united in government is very small and the members know one another as kindred.

I have already explained the adoption into other clans of infant children whose clan kindred have become extinct. Such cases seem to be infrequent, but there are other cases of adoption which are more common. Children, and even adults, captured in war are usually adopted into some clan. Our European ancestors observed a curious custom among the tribes of this country, that of running the gantlet. A prisoner was compelled to run between two lines of his captors armed with sticks and other missiles. This was formerly supposed to be a method of torture. On investigation it is proved to have had quite another purpose The prisoner was given an opportunity to show his mettle, his courage, and his ability to fight his way through a line of clubs. If he acquitted himself manfully, any woman among the captors might claim him for her child. Children ran the gantlet of children only, but adults ran the gantlet of men, women, and children. Female children were rarely submitted to this ordeal. The adoption of a captive was his new birth into the clan, and his official age dated from his new birth. If he proved himself skillful, useful, and especially wise, he might be promoted from time to time, until at last the captive might become a chief.

Captives taken from tribes that are hereditary enemies and with which there have grown historic feuds, and who are held to practice monster sins, such as cannibalism, are given a fixed status from their birth into the clan, which they can not pass without promotion; for all persons naturally born into the clan may call them younger and have authority over them. This is the primal form of slavery, but by good behavior the rules of such slavery may be greatly relaxed, and captives from hated enemies may ultimately become promoted kindred.

A person may not marry another of the same clan, but usually he must marry some one of the tribe not in his own clan. Before the marriage customs of the tribes of America were properly understood, a theory of endogamy and exogamy was developed by McLennan and others, which has played quite a rôle in theories of ethnology. There are a great number of languages spoken by the tribes of America; so that the terms used to signify the clan and the tribe are

multitudinous. The earlier writers on marriage customs in tribal society culled from the literature of travel a vast body of stories about tabus in marriage; and it was finally concluded that certain tribes required their tribesmen to marry women who were foreigners and aliens. This was called exogamy. Then it was held that other tribes required or permitted their tribesmen to take wives within the tribe, and this was called endogamy. So an attempt was made to classify the tribes of mankind, not only in America, but elsewhere, into two groups, the exogamous and the endogamous.

Now, we understand that in all tribal society there is an endogamous or incest group, which we call the clan in savagery, and the gens in barbarism; while at the same time the clansmen usually marry within the tribe by regulations which vary greatly from people to people. It seems that the ties of marriage are used to bind different peoples together in one larger group which we call the tribe, and that the clans of a tribe may at one time have been distinct tribes; that when tribes become weak, or desire to form permanent alliances with other tribes for offensive and defensive purposes, such tribes agree to become clans of a united body, and by treaty confirm the bargain by pledging not to marry women within their own groups, but to exchange women with one another. "Give us your daughters for wives and we will give you our daughters for wives." Such a bargain or treaty, enforced for many generations as customary law, ultimately becomes sacred, and marriage within the group is incest. Perhaps there is no people, tribal or national, which has not an incest group; so all peoples are endogamous, as all peoples are necessarily exogamous. The distinction set forth by McLennan proves to be invalid everywhere and among all peoples.

Among the tribes of America there are many customs establishing the group within which a person may marry. It may be that a man may marry within any clan but his own, or it may be that a man must marry within some particular clan. Sometimes there is a series of clans, which we will call *A*, *B*, *C*, *D*, and *N*. A man of *A* must marry a woman of *B*; a man of *B* must marry a woman of *C*; a man of *C* must marry a

woman of *D*, and so on; and, finally, a man of *N* must marry a woman of *A*. Tribes themselves composed of clans unite with other tribes also composed of clans; and as a result of this consolidation into larger tribes there is found, in actual study of the Amerinds, a great variety of systems, all having the common feature of an incest group or clan, and provision for bonds of friendship, which are perennially sealed by intermarriages. It thus happens that universally among the tribes of America marriages are regulated by customary law; and the parties married have no legal right to personal choice. Yet there are often ways established by which the clan confirms the personal choice. Though marriage is always regulated by the elders of the clan, yet they often consult the wishes of the candidates. There are three marriage customs, springing up from time to time among the tribes, which require special mention.

A young man and a young woman may form a clandestine marriage and live apart in the forest, regardless of the consent of the elders of the two clans involved, until a child is born, provided the tabu is not violated; that is, that the two parties do not belong to the same clan.

There is another custom which the exigencies of life frequently produce. A clan may have many male candidates for marriage, while the clan in which their brides are found may have few eligible women. Then the young man may wish to marry a woman in some clan other than that in which his rights inhere. In such a case the wife may be captured; but the capture is always a friendly one. If the girl has other contestants for her hand, she must be won by wager of battle. The battle is fought as a hand-to-hand conflict, without weapons other than those furnished by nature.

A third custom is found, especially on the western coast of North America, where men buy their wives. This seems to occur in the case of polygamy, where the man who takes a second or third wife not only remunerates the woman's clan, but makes presents to certain persons throughout the tribe who might have an interest in disposing of the girl in some other way. This seems to be the case in many tribes where "potlatch" weddings are observed, and it may be true in all.

The possession of property which is exclusively used by the individual, such as clothing, ornaments, and various utensils and implements, is inherent in the individual. Individual property can not be inherited, but at death is consigned to the grave. Property which belongs to the clan, such as the house, the boat, the garden, is common property. No article of food belongs to the individual, but is the common property of the clan, and must be divided by the authorities of the clan, often according to some rule by which a special portion is given to the person who provides the food. Thus, when a hunter kills a deer, a particular portion is given to him; other portions may be given to those who assisted in its capture; and all the rest is divided according to the needs of the individuals of the clan. The women gather fruits, seeds, or roots; that which is consumed at the time is divided by like methods, but that which is preserved for future use sometimes becomes the property of the clan.

The elder-man of the clan is responsible for the training of children, and it is no small part of his duty daily to exercise them in their games and to instruct them in their duties. Thus he who enforces clan custom is the same person who instructs in clan custom; and when councils of tribe or confederacy are held, he is the representative of the clan in such councils. The chief of the confederacy is usually the chief of one of the tribes, and the chief of the tribe is usually an elder-man in one of the clans. There are clan councils, tribal councils, and confederate councils.

The council is the tribal court and legislative body in one. All Indian life is cooperative; and all cooperative life is regulated by the clan, the tribe, or the confederacy. The clan hunt and the clan fishing expedition are regulated by the council; and when the clan or the tribe would move the site of its village, the council must so decree and regulate the matter. The council of the clan settles disputes between individuals of the clan; the council of the tribe settles disputes between clans; and the council of the confederacy settles disputes between tribes. Sometimes the members of the clan live separately by households; but often the clan will build a

house for all its members, when the households will be relegated to distinct sections. It is curious to see the people dissolved into households at one time, and at another aggregated in clans. If the clan moves temporarily to a favorite locality, where roots or fruits are abundant in their season, it may dissolve into households which provide for themselves rude shelters of bark, brush, and leaves; but if the clan wishes to change its habitation permanently, it is likely to construct a new communal dwelling for the joint use of its members. Thus, the clan seems to be the most permanent and most fundamental unit in the organization.

In the study of North American tribes it is always found that the purpose assigned and recognized for the organization of that unit is the establishment of peace. Two or more bodies go to war, and finally agree to live in peace, and make a treaty; and the terms of the treaty are invariably of one character, if the bodies unite as a tribe. The fundamental condition for the organization of a tribe is, that the one party agrees that its women shall be the wives of the other, with a reciprocal obligation. This is the characteristic which distinguishes tribes from confederacies. A body of people organized for the purpose of regulating marriages is a tribe. A body of people organized for war is a confederacy. Thus the organization of a tribe itself is the first recognition of the principle of peace in the origin of constitutions. The confederacy is always the unit of war organization. It is doubtful—in the present stage of investigation, at least—whether a tribe, as such, ever engages in offensive war. Confederacies become tribes by customary intermarriages, especially when the tribe becomes the tabu unit of intermarriage. It is thus that the three units—the clan, the tribe, and the confederacy—are variable from time to time, although at any particular time these three units can be distinguished as well as the family or household unit.

There are peculiar circumstances under which the household unit is variable. This variability depends upon customs which sometimes spring up among tribes, and are known as polyandry and polygamy. Sometimes the man who marries a woman is entitled to marry her sisters as they become of age. There are

other conditions under which men become polygamists, but they are not very common in savage society. In the same manner, there are cases in which the women of the clan are few as compared with the men to whom they are due; and, hence, one woman becomes the common wife of several men. This is polyandry. It is not certain that polyandry has ever prevailed in an Amerind tribe; but certain forms of polyandry are found elsewhere, especially in Australia, where the clan system has an aberrant development, doubtless due to the development of many tribes of the same linguistic stock, and to the spread of the same totemic clan largely over the Australian continent.

Another organization, which involves all civic relations, must now be explained. There is a body of men (and sometimes of women also) who are known as medicine-men or shamans, and sometimes as priests, who control all religious ceremonies and who are diviners. As disease is supposed to be the work of human or animal sorcery, it is their function to prevent or to thwart it. They have the management of all ceremonies relating to war, hunting, fishing, and the gathering of the fruits of field and forest. It is their office to provide ceremonies for abundant harvests, to regulate the climate, and generally to divine and control good and evil. The principal shamans are men; but all the people are united into shamanistic societies. Usually there is some determined number of these societies, over each of which some particular shaman presides, and he has subordinates, each one of whom has some particular office or function to perform in the societies. Sometimes a person may belong to two or more of these societies; usually he has the privilege to join any one, and a revered or successful shaman will gather a great society, while a shaman of less influence will preside over a feebler society.

Let us call these societies ecclesiastical corporations, and the shamans priests. The way in which they are regimented and controlled differs from tribe to tribe, and there is a great variety of ceremonial observances. In all civic councils the ecclesiastical authorities take part and have specified functions to perform; and they introduce into civic life the ceremonies which they believe will produce good fortune. Perhaps the

ecclesiastical authorities may be more powerful than the civic authorities, and the hereditary line of special ecclesiastical governors may gradually overpower the civic constitution and absorb it as a secondary element in the ecclesiastic constitution. It must be remembered that the chief priests are men, and that the women play a very small part in ecclesiastical affairs. Now, as the men manage ecclesiastical affairs as chief priests, so civil affairs are managed mainly by men as elder men. The conflict which sometimes arises between the two forms of government is mainly between men and men, or between able elder-men and able shamans; but sometimes both officers are combined in one person, and the great elder-man may also be the great shaman.

BARBARISM

In barbarism the tribe is composed of groups which we call gentes, and is said to have a gentile organization. Among the Romans such persons were known as agnates. A group of agnates is composed of persons who reckon kinship through males. Gentile organization is best known through the early history of the Romans and Greeks; it was well developed among the peoples of early history who spoke the Sanskrit language; it appears among the early Anglo-Saxons; a few tribes in North America have gentile organization, and it has been at one time or another widely spread throughout the earth. As a clan is a group of people who reckon kinship through females to some ancestral female, real or conventional, so a gens is a group of people who reckon kinship through males to some ancestral male, real or conventional. It seems that the primordial constitution of the tribe is by clanship and that the clanship tribe is developed into the gentile tribe. Most of the tribes of North America have clanship organization, yet there is a goodly number with gentile organization, while perhaps it may be said that a majority of the clanship tribes have some elements of the gentile organization, and there is scarcely a gentile tribe which has not some feature of clanship organization as a survival; so that it may be justly affirmed that a great many of the tribes on this continent are

in the stage of transition. But more than this—all of the tribes of North America have come into association to a greater or less degree with the European invaders, and have thus taken on some of the elements of civilized culture, so that the Columbian period has been one of very rapid development in tribal organization. Now, again and again we find abundant evidence that the savage tribe yields its peculiarities by exchanging them for barbaric characteristics. A review of the evidence which has been accumulating through a series of years on this subject demonstrates that clanship organization develops into gentile organization. To set forth in a summary manner how this development is accomplished will perhaps be the best method of explaining the nature of a barbaric government.

In savagery there are societies which are organized for the purpose of securing the cooperation of ghosts in the affairs of mankind. These societies are often called phratries or brotherhoods, and are the custodians of the lore of unseen beings. They occupy themselves with ceremonies and various practices intended to secure advantages and to avert evils which are attributed to multitudinous ghostly beings which are supposed to have tenuous bodies and to live an occult and magical life as they take part in human affairs. Everything unexplained is attributed to ghosts. The leader in these thaumaturgic societies is called by white men a medicine-man, or sometimes priest, or even a thaumaturgist; a better term is shaman. The phratry over which the shaman presides has a special care of health and the occult agencies of welfare, so he presides over elaborate ceremonies which have a religious significance. These phratries, called by some of our writers societies, take a very active part in savage society, for much of the time of the people is occupied in the performance of the rites of thaumaturgy antecedent to any enterprise of importance in which the clan may engage.

These phratries which are organized to obtain the assistance of ghosts develop periodical ceremonies which are designed to secure the annual productions of nature upon which human welfare depends. Thus the fishing tribes of the Pacific coast

that depend largely for their food on the coming of the salmon from the sea at particular times have ceremonies designed to secure their coming; those that depend upon cereals, like wild rice, also have their ceremonies to invoke the aid of ghosts to bring abundant seeds. In arid lands, where vegetation is so dependent upon rain, these ceremonies take the form of invocations for rain. Thus in every region of the United States periodical ceremonies are performed to secure harvests and supplies of game.

Again, human beings are subject to many diseases which are universally attributed to ghosts. Ceremonies to ghosts are common for the purpose of propitiating them or of preventing their malign influences or even of obtaining the aid of some ghosts to defend the people from other ghosts. Societies, or incorporations, as we have called them, but which are often called phratries, or brotherhoods, are first incorporated among men as religious societies on the theory that the good and evil of life are largely dependent upon ghosts.

In tribal life the head of such a society, if it be a man, is known as father; in some few cases the head may be a woman, when she is known as mother. The children of such a head of a society are known as brothers and sisters, hence among classical peoples the societies were known as phratries.

These brotherhoods constitute an important element in savage society, and their chiefs have on some occasions quite as much influence as the governmental chiefs. Often the father of the brotherhood and the elder-man of the clan is the same person. When this is the case, authority is doubly established. Ultimately this union effects a reorganization of the tribe itself, and clans become gentes. How this is accomplished we must now explain.

Clans are the bodies corporate for all industrial purposes. Much of the hunting is clan hunting without firearms; the wild animals have to be entrapped or captured by many devices in which all the members of the clan take part. These clan hunts are important occasions when distant woods, distant valleys, or distant mountains become the theater of operations. Under these circumstances it sometimes happens that the male

members of the clan desire to have their wives with them, but their wives belong to other clans and have their households with other clans, hence on such hunting excursions the clan organization is to a greater or less extent interrupted, and the women fall under the control of their husbands instead of their brothers and mothers' brothers. This is but a temporary arrangement; but it often occurs when the clans visit some favorite stream or seaside resort to gather and dry fish. By and by agriculture is developed. The cultivation of the soil seems usually to have been first developed in the arid lands. Everywhere in America where a primitive tribe has engaged in irrigation for agricultural purposes we find a tribal village as a central winter homestead, with a number of outlying villages or rancherias, which are occupied by the several clans during the season of irrigation.

To understand the nature of primitive agricultural industry in America it becomes necessary to take these facts into consideration. In every great ruin group in America situated in the arid lands where agriculture was practiced, and also in such humid lands as were cultivated, a central ruin of the habitations of the tribe is found with outlying ruins or rancherias. When people have thus reached the state of agriculture where irrigation is practiced there is still stronger reason why the clansmen should control their wives and children. Irrigation requires the management of the stream which is used to fructify the soil, and irrigation works must be constructed. The stream must be dammed and the water carried over the land by canals; this means the construction of works that have a perennial value, and attention to the crops during the season of irrigation as well as that of planting and harvesting. One clan on one little stream is separated from the other clans, who also have their streams during the entire season of growing crops, and the clan is thus segregated in a little summer village of its own, and in a distinct village from that occupied by the tribe during the remainder of the year.

Again, as animals are domesticated and flocks and herds are acquired, wives and children become still more essential to the prosperity of the men, for the women and children must take

part in the care of the flocks. By all of these agencies the control of women and children is taken from elder brothers and given to the husbands, and the practical accomplishment of this change results in a new theory of the family—the children are no longer considered the children of the bearing mother, but of the generating father; that is, the children belong to the father, not to the mother, for in tribal society there seems to be an inability to conceive of mutual parenthood and authority. In the clan the mother is the parent and owns the children, and the father is but temporarily the guest of the wife and children.

When the elder-man has the authority of the shaman, he easily usurps the authority of the elder-man of his wife's clan, especially when such authority is conducive to his industrial interests; for the same reason that impels the elder-man to this acquisition of authority impels the elder-man of his wife's clan to a corresponding assumption of authority, so the interest of the one is the interest of the other. There may be many clans in the tribe, and all the elder-men are interested in the like acquisition of authority and are alike willing to give and take. When this transfer is made into what we now call the gens, and the elder-man or chief of the gens has authority over his wife and children, this authority waxes very great, for he has a double power—that of the elder-man and that of the shaman, and we have the same state of affairs among the barbaric tribes of America that is exhibited to us in the historic account of the tribes of the Greek and Roman peoples, and in fact of all of the Indo-European peoples. Under these conditions kinship is reckoned in the male line and the clan is transformed into the gens. The ruler of the gens is the patriarch who has a right to control by reason of superior age, for the law that the elder rules is still supreme; but the elder rules with a rigor unknown in savage society.

The phratry does not become the gens, though it is efficient in transforming the clan into the gens, and the phratry or brotherhood becomes a fifth unit in the hierarchy of incorporations which constitute a barbaric society. The family remains as a more or less distinct unit of organization composed of the father, mother, and children, or it may hold together as a group

ruled by the grandfather. The gens still remains as a group controlled by the patriarch or chief who is in fact or by legal fiction the elder-man; but there is a tendency in the gens to break up into a number of households, each one ruled by a real or conventional elder-man. Then comes the phratry, to which are relegated many functions.

We must now understand something more about the religion of gentile tribes. In this stage private and public religion are pretty clearly differentiated. The elder-man of the gens officiates as the priest in the domestic worship, but the public worship is conducted in the council chamber, or, as it is usually called in America, the kiva, which is the place of meeting of a brotherhood or phratry, and the ceremonial worship of the people is conducted in this place. Among the Greeks the kiva was called the prytaneum. Various names are used among the barbaric tribes of America, and various names were used among the barbaric tribes of the Orient. In the upper stages of savagery there is developed a calendar system by which the kiva ceremonies are regulated. The various codices which have been discovered in Central, North, and South America are all of them calendars designed to regulate the ceremonies of the kiva.

The kiva worship is controlled by the phratral unit; that is, by the brotherhood. The place of worship is also the place where the council of the brotherhood is held. Sometimes the council of the tribe is held now at one, now at another, of the kivas. The kiva is the general place for divination where the signs are consulted for the purpose of determining whether enterprises will be successful or not All of the operations of the people and all of the things in which they are most deeply interested are controlled by these ceremonies held in the kiva. Especially is the weather controlled, for it is here that they pray for rain or for the abatement of storm. It is here that the ceremonies are performed which determine the nature of the crops. It is here that health or sickness is found. When the individual is once under the power of a disease the shaman may go to his relief and gather about his sick bed the members of the phratry, who sing, dance, and perform other ceremonies

for his recovery. It is in the kiva that trials for witchcraft are held.

In all barbaric societies and in many savage societies there is a place for the tribe to assemble. When architecture is developed this is called the temple, but very often it is a mere plaza under the shelter of trees, where special seats are furnished for the brotherhoods. Here men are promoted or invested with horns, feathers, or stripes—the investiture is always a time of merrymaking, with a feast and with dancing—and here men are deposed.

Tribal life is chiefly public life. There is little domestic seclusion; often the house is a communal house for the entire clan or gens. Nearly all hunting is public hunting; nearly all fishing is public fishing; nearly all gathering of seeds is public gathering of seeds; nearly all gathering of roots is public gathering of roots; all agriculture is public agriculture, and all herds are public herds. The kiva is the gathering place of the brotherhoods, and here they meet not only for religious ceremony, but to pass the time in conversation or in jest. Here the shamanistic orator entertains the people, and here the men do their weaving and the women their basket work. The kiva is the general place of rendezvous.

In barbarism, where all the units of regimentation are fully developed, there are families, gentes, tribes, and confederacies, and for every unit there is a system of worship, and the high priest of the unit is the elder-man or chief of the unit; worship is thus specialized. The hearth of the family is the altar of the family. The place of worship of the gens is the kiva or prytaneum. The kiva of the chief of the tribe is usually the kiva of the tribe. But sometimes the tribe has a special kiva independent of those of the gentes and we call it the temple.

The chief of the confederacy is also the chief of the leading tribe, and the kiva of the tribe may thus become the kiva of the confederacy; usually confederacies only have temples. Thus three places of worship may always be recognized in barbaric society. On the hearth-stone worship is performed by oblations and other ceremonies, and sometimes with paraphernalia; in the kiva worship is performed with much ceremony and with

very elaborate paraphernalia, while in the temple worship is performed especially for militant purposes and is elaborate and ceremonious. I know not why four or five places of worship should not be developed in tribal society; but I have never discovered more than three, though I always discover the five kinds of worship.

When the fathers of the phratries become the elder-men or chiefs of the other units in the hierarchy of governmental units, barbaric society is fully organized and savage society is fully overthrown.

When we come to apply the criteria which we have set forth to particular tribal bodies, a difficulty arises in segregating savage bodies from barbaric bodies, for in many instances in America we find some of the characteristics of savagery and others of barbarism. Gradually a custom has grown up among the students of these societies to relegate a tribe to savagery which has the characteristics of savagery predominant, and to relegate a tribe to barbarism which has the characteristics of barbarism predominant; in so doing we make clan organization by kinship in the female line the deciding mark of savagery, and gentile organization by kinship in the male line the deciding mark of barbarism.

MONARCHY

The cradle of civilization was rocked by the waves of the Mediterranean. Of the origin of one of the monarchies here established we have much history. In the Greek and Latin languages there is found a literature in which is recorded the development of the Hellenic and Latin tribes into a monarchy extending far beyond the shores of the Mediterranean, through Europe on the north and large portions of Asia and Africa on the west and south. Of the nature of the monarchies absorbed by Rome and of the nature of the tribes absorbed in northern Europe we have comparatively little data, but of the Hellenic and Latin tribes we have much history. By adding to this history the comparatively little-known history of the tribes that were amalgamated in the monarchies on the south, and the still less known history of the tribes on the north that came

under the dominion of Rome, and by interpreting this tribal history from the standpoint which modern civilization has gained by the study of savage and barbaric peoples, we are able to reconstruct an outline of the history of the origin of the Roman empire.

As the Roman empire was founded on the inchoate monarchies into which the Hellenic and Latin tribes were developed, the literature of this transmutation is recorded in these languages. The modern European nations are in some sense the offspring of the Roman empire, and a family of these nations was developed.

After the fall of the Roman empire a period of centuries elapsed which are often called the Dark Ages. History which we may not stop to recount led to what is usually denominated the Revival of Learning. Then the younger nations sought in the literature of Greece and Rome for the history of their origin, and they found in these languages the records of a high state of culture, especially in architecture, sculpture, poetry, and metaphysics. Thus the Greek and Latin languages were the repository of "the wisdom of the ancients" on these subjects. To trace the evolution of European religion it is necessary for us to go to its source in the Hebrew; but to discover the origin of the governmental institutions we must go first to the Greek to discover the nature of the barbaric tribe, and then to the Roman to discover the nature of the monarchy, and from the two sources we may learn the development of tribal society into monarchical society. We must now characterize in a few sentences the agencies by which barbaric society is transformed into monarchical society.

We first note that the more highly cultured tribes are domiciled in walled cities. Every such city is a center of culture superior to that exhibited by tribes not yet domiciled in walled cities.

In savagery the custom of causing the captive to "run the gantlet" was early observed by civilized men, but the significance of the custom was not understood, for it was supposed to be only a method of torture. Prisoners who have long

remained in the custody of their captors tell us of the significance of the custom. Modern scientific investigation clearly reveals its nature. There seems to be a desire among savage people to increase their numbers by incorporating captives into the body politic. Such captives are often selected to take the place of persons killed or captured by the enemy. Sometimes the captive is required to exhibit his courage and skill by causing him to "run the gantlet," and if he emerges from the ordeal with honor some woman adopts him as her son. When he is thus taken into the clan, his birth dates from his adoption. He is therefore younger to all the members of the clan who at that time are living, but he is elder to those subsequently born. The captive may be promoted from time to time as other members of the clan if he wins such promotions by good conduct. He may thus become the elder-man of the clan or even the chief of the tribe or confederacy. There are circumstances under which the captive is refused promotion, as, for example, when captives are taken from hereditary enemies who are believed to be sorcerers, or who are popularly believed to be cannibals—that is, to eat human bodies for food instead of in a ceremony of magic, which is the universal practice. The captive is thus doomed to perpetual *youngership*, if the term may be permitted—that is, to perpetual servitude—because all other members of the tribe may consider him as last born and never to be advanced in age. In savagery there seems to be but little evidence of this state; but when in barbarism agricultural and zoöcultural industries are organized, and other industries are carried on for exchange, then the labor of captives becomes an important factor in the industrial life of the people, so that captives are taken, not simply to reduce the numerical power of enemies and to increase the numerical power of the captors, but they are also taken as laborers; then labor slavery is first developed. Before this stage family slavery only exists. In the brief account which we are giving, what seems to be a radical change must always be considered not as instantaneous but as requiring centuries of history with its vicissitudes. Many different examples, occurring at different times, furnish instances of evolution representing only a

part of the final change—one of changes on changes in the treatment of captives which result at last in changing family slavery into labor slavery. We will hereafter see how labor slavery is changed into chattel slavery.

Walled cities become cities of wealth, because they are centers of esthetic and industrial art. The aggregation of wealth in these cities makes them rich prizes and stimulates war, so that wars are instigated not only by current disagreements, as in savagery and barbarism, but by greed for wealth, which consists in the stores accumulated in cities and in the labor of the inhabitants when captured. Vengeance is a powerful motive for war, but greed has greater might.

When men are gathered into cities, the land which they cultivate extends far outside their walls, and the animals which they domesticate are pastured on distant hills. In the stage which we are now discussing, slaves are employed as artisans in the city, and they are also employed as agricultural laborers and herdsmen in the country. Their employment in this manner requires surveillance lest they escape. To prevent their escape and to relieve the constant watchfulness of their masters, it becomes necessary to give them many inducements to remain and labor; this is accomplished by giving them an interest in the soil and an interest in the flocks and herds, and by promoting their domestic life. Thus slaves become clients. Sometimes whole tribes are conquered and employed as clients to cultivate their own lands. Thus captives become serfs attached to the soil, and the title to the serfs passes with the title to the soil.

Still the conquering city may reduce other tribes to vassalage and require of them annual tribute, but permit them to continue in the pursuit of happiness and welfare by their ancient methods subject only to the collection of tribute. Sometimes the tribute may be in men, and is furnished to the armies of the conqueror.

It is thus in monarchy that various forms of servitude are found, as family servants, as clients, as serfs, as vassals, and chattel slavery itself is common.

In tribal society the integration of bodies politic is mainly

by treaty agreement for offensive and defensive purposes; but in monarchical society much integration is accomplished through conquest, impelled by ambition, by which foreign peoples are reduced to subordinate positions. They may be made slaves by the greed for gold, but they may be made subjects by the ambition to rule. Such subject provinces must pay tribute, and usually the tribute-bearing people must be subject to rulers who are themselves subject to the central government, as members of the central aristocratic class. Thus monarchies are integrated through slavery and provincial government.

There is yet another element of the transmutation which we must set forth. This is the consolidation of religious power in the chief of the central city, who is not only a king but is high priest of all the units of the monarchy. In the central city resides the central authority. The central tribe, in which are not included domestic servants, constitutes a distinct body politic with all its hierarchy of units, with its chief ruler who is also high priest, and subordinate rulers who are also subordinate priests. The subject provinces are governed by rulers who emanate from the central city. The people of the central city thus constitute an aristocracy to govern the subject provinces. When things are brought to this pass the pure monarchy is developed. It will be seen that the fully fledged monarchy is a stage of society of long growth, but the steps in its growth are very irregular and often turn back before monarchical society is instituted.

We have said that the emperor is the high priest of the people. Finally the high priest is fired with the ambition to become the high priest of all religions. Then comes the time of persecution for non-conformists, and then comes that cause for war which is most potent—the doctrine that false religions may be eradicated by force. Then comes the profound belief in the thaumaturgic doings of the god of aristocracy as miracles, and its concomitant belief that the doings of false gods are sorcery.

Such are the agencies by which tribal society with kinship regimentation is developed into national society with district

regimentation, where the land of the aristocracy is the home of central government, and the provinces subordinate units of the nation. In savage society the most important unit of organization is its body of kindred who reckon membership in the female line. In barbarism the most important unit of regimentation is the body of kindred who reckon membership in the male line, and the patriarch becomes the high priest. In the monarchy the people are regimented by lands. The capital of the country of the aristocracy is the seat of government, the provinces are minor units of government, and the monarch is the vice-regent of the god.

In monarchy a method of government and a consequent arrangement of society in hereditary ranks obtain. As the units of government constitute a hierarchy of control in both civil and religious conduct, so also there is a hierarchical aristocracy. Position in this aristocracy is determined by hereditary descent. Every person is born into a rank in society.

The kingship is inherent in a family and descends from father to son. In the failure of lineal descent the kingship passes into a collateral line. Thus a dynasty is produced which continues from father to son, or to nephew, or occasionally to daughter or niece, until such dynasty is overthrown.

Other members of the aristocracy are nobles of various ranks; nobility passes from father to son, the eldest living son taking precedence, and the title may pass beyond lineal descendants into collateral lines. The monarch may create new orders of nobility at will; and he may create nobles from the common ranks, and may also promote from rank to rank. It is thus that position among the nobles is in the gift of the crown as a reward for service. A shrewd monarch uses his power not only to reward men for service but also to keep up a body of persons of superior capacity to cooperate with him in sustaining the royal authority and dignity.

In this manner a governing body is constituted in a hierarchy of ranks, social, governmental, and religious, with the power which inheres in wealth, the power which inheres in government, the power which inheres in the command of the

armies, and the power which inheres in ecclesiastical domination and dignity.

This comparatively small group of persons rule over the people, who are also arranged in a more or less clearly defined hierarchy of ranks, as freemen, serfs, and slaves. The freemen constitute a middle class, as merchants, artisans, farmers, and soldiers. In this class also there is a tendency to differentiate the people by their occupation into hereditary groups as guilds, so that the man inherits the occupation of his father. An extreme development of guilds results in the development of caste. In caste intermarriage between groups is forbidden; the higher castes become sacred, while the lower castes are held by the higher castes as unclean, and not only is intermarriage prohibited but many other social functions can not be carried on in common.

The failure of lineal descendants in the monarchy leads to disputes over the succession, and dynasties are often changed. The same thing occurs in the successions which occur in the ranks of the nobles. Sometimes these successions become a matter of interest to the crown, so that the monarch often takes part in determining successions, thus rewarding his friends and punishing his enemies. Throughout the stage of monarchy great armies are organized, and sometimes successful commanders arise, and such commanders are rapidly promoted into the ranks of the aristocracy. Sometimes successful warriors become ambitious even for supreme rule, and they overthrow the reigning dynasty to usurp its wealth, honor, and power. Thus hostile dynasties are produced.

We have now presented a meager and perhaps inadequate account of that stage of society which we call monarchy; but the hope is entertained that the characterization has been sufficient to make plain how kinship society is transmuted into territorial society, while the principle of kinship with authority and privileges with the elder remains in the governing groups as an aristocratic body.

REPUBLICKISM

Tribal governments are almost pure democracies, if we understand by that term that leadership and measures of government are submitted to the voice of all the people for decision. The ideal of tribal government which is forever held in view, though it may be obscured, is that of a pure democracy founded on the will of all the people directly expressed by them as individuals.

When national government is established on a territorial basis, democracy is overthrown and kingship with aristocracy takes its place, and monarchial society is organized. Monarchical society, in turn, gives place to a fourth stage, which we here call republickism. We use the term in no partisan sense and select a new form of the word in order to avoid partisan implications. The term republicanism, as used by statesmen, of whatever party they may be, usually signifies a method of representative government. It is in this sense that we use the term republickism, and we leave the term democracy and also the term republicanism to be used with partisan meanings.

As the fifteenth century drew to a close, Columbus, the great navigator and discoverer, became the promoter of an enterprise to sail westward from Europe in quest of a better route to the Indies, a land of fabulous wealth. For centuries scientific men had believed in the spherical form of the earth, but the great body of the people did not accept the doctrine. After many unsuccessful attempts Columbus at last sailed westward with a fleet bought at the price of the good Queen's jewels. Instead of discovering a route to the Indies, he discovered a new world. Perchance others had previously discovered land at the north, but they knew it not as a new world, nor did they know it as a gateway to the land of fabulous wealth, nor were they impelled to the discovery by the acceptance of a doctrine of science. The merit of Columbus was his faith in science, and as a reward for his faith history crowns him as the Great Discoverer. The New World was the trophy of science.

The New World became the theater of new enterprise. The discovery gave to science the hope that it might prevail against superstition. Perhaps the thought that science may be useful to mankind was more potent with boon to man than the enlargement of the theater of industrial enterprise.

Be this as it may, the New World became the home of republics. The example of these republics has spread the egis of free institutions over much of western Europe, and the leaven of freedom works unrest for all monarchial governments of the world. The principles of representative government may seem to flourish best when republics are founded in due form, but they have an almost equal potency in reforming monarchical governments. Such governments may not formally adopt republickism in terms of free institutions, but by a legal fiction they may engraft on the monarchy the substantial principles of republickism, though nominally they are governed by an aristocracy with a kingly chief. Formal republickism and virtual republickism seem thus to be competing for universal dominion, though competition may in fact be cooperation.

The agencies at work to transmute monarchy into republickism may be summarily, though imperfectly, stated in the following manner:

First, the industries of the world are undergoing transmutation. Inventions multiply with the scientific thought that was born with the discovery of Columbus. Brawn is governed by brain, and brain through brawn governs the forces of the world, and thus men are emancipated from toil. Through invention toil is raised to the dignity of industry sweetened with pleasure and rewarded with welfare.

The invention of machinery and the development of scientific processes of production have had potent effect on the reconstitution of society. Handicrafts have been revolutionized by the introduction of a high degree of intellectual skill, as manual skill is relegated to the operation of machinery to which great precision is given. When manual skill was obtained only by long practice in a restricted number of manual operations, it was held to be necessary to serve a long apprenticeship to a trade; but as the machine performs all the

nice mechanical work, the artisan turns his attention to the control of the machinery, and to be successful in its manipulation he must understand the principle of mechanism and the application of powers to the accomplishment of human purposes. The skill now required in handicraft is the skill of intelligence supplemented with universal skill in handiwork. It is thus that industry is emancipated from the system of slavery involved in apprenticeship, and a new system is rapidly developing in which childhood and youth are taught the fundamental elements of all handicrafts in the common schools. Political economists have deplored the inability of laborers to change their occupation, seeing that the introduction of machinery destroys many a special handicraft, and the laborers employed therein are compelled to seek employments without the benefits of apprenticeship. The introduction into industry of scientific methods practically makes them all accessible to all men.

Another change to be noticed is the enlargement of the sphere of commerce. Production may now be carried on in the most economic manner wherever special conditions exist favorable to production; climates may be more thoroughly utilized for the development of special products, and powers may be utilized wherever they are found under the most favorable conditions in nature. The enormous cheapening of products by their narrow specialization and by their multiplication through the efforts of the few who are the most favorably conditioned for the special production requires that the producers of large quantities of special goods have their products distributed to great numbers of consumers, and thus commerce is multiplied. For the development of commerce to meet these new conditions inventions are employed, and the highways of commerce are made to ramify throughout the country and throughout the world. All of these processes cooperate in the reconstitution of society by specializing industries and integrating them through commerce, and the lesson is taught in everyday life that human success is best promoted by serving others.

Second, from the primeval state of society up to that state

of society which we call republickism, tribes and nations were kept asunder by walls of language. An unknown tongue was a herald of enmity and a mark of folly, and aroused all the hate of superstition. When culture was buried in the classical languages, and when the accomplishment of the student was measured by his knowledge of these tongues, a great impetus was given to the acquisition of languages. Since science is promoted by all civilized nations, science itself demands a knowledge of many modern tongues. By all of these agencies it is discovered that a foreign tongue is not an unmeaning jargon, and language itself is no longer a barrier between civilized people. The wheels of commerce speed civilized men from land to land and they find themselves integrated by common interests.

There is a third agency by which the transmutation of society is accomplished. The literature of all lands is read in every land. The current history of all lands is recounted in every land. The agencies of intellectual culture are not restricted by national boundaries. Higher than all, and more potent than all, is the universal brotherhood of science by which the discovery made by one man is revealed to every other man and by which the generalization made by one man enriches the thought of all

A fourth agency for the transmutation of society is found in the fine arts. The musical artist sings for the world. The limner paints for all lands. The actor impersonates for the universal stage. The novelist portrays for every fireside. The poet chants a lay to every dreamy heart. Thus the esthetic arts make a universal appeal to the finer feelings of mankind and forever teach the lesson of fraternity, and with the balm of joy heal the wounds of conflict.

Fifth, all of these indirect agencies for the transmutation of society cooperate with the development of governmental principles due to the increasing intelligence of civilized men. With knowledge comes a love of justice that recognizes that rights may best be secured by the performance of duties. Forever and forever is this lesson taught by advancing culture. In the strife to establish justice through the agency of government

men learn to delegate their power to representative men chosen for their wisdom.

The first presentation of the true nature of representative government is recorded in the literature of Greece. In Plato's Republic we find romance dealing with ideal government. The old philosopher dreamed of a state of society in which the conduct of government should be relegated to the wisest and best of mankind. Further, he attempted to set forth the conditions under which the wise men should rule by delineating their marriage relations and their property rights in terms that seem strange and even bizarre to modern thought. Alas, he did not properly comprehend the method by which the wise men could be selected. His theory of government by the wise and good became the ecclesiastical polity of the two great churches of early civilization—the Roman church and the Greek church, which were organized to secure the rule of the wise and good, and by both civil affairs were made subordinate to ecclesiastical affairs.

While Plato thus became potent in founding the policies of these churches, Aristotle was more influential in founding their philosophies. The rôle which these two great thinkers played in the history of early civilization was profound, for they cast the thought of centuries into molds of learning, and these molds gave figure and structure to philosophy and to church polity which has lasted until modern times, when the molds were broken only by the blows of science.

We have stated that to Plato we owe the earliest comprehension of the principles of representative government. These principles we must now set forth.

It is an inherent principle in society that the many follow where the few lead. Knowledge is always born of one and diffuses to the many. The annals of science are the record of the discoveries of individuals. Advances are made by discoverers and the world of science is dependent upon intellectual leaders. A new thought may lie dormant until it finds clear expression. It often happens that new thoughts gain acceptance only when they are presented by some person who has the genius of expression, but when they come to be deftly expressed they are speedily diffused among mankind.

We discover in nature that all knowledge has its purpose, and that this purpose is its utilization in affairs of life. All knowledge must be utilized in this manner before it has its final expression which all men may understand. Universal diffusion of knowledge can come only by its utilization in the affairs of life which interest all mankind. This utilization depends first upon the inventor and second upon the undertaker—the entrepreneur. It is thus that knowledge must have a triune leadership in the discoverer, the inventor, and the undertaker, and they must cooperate for the increase and diffusion of knowledge among men; then only does knowledge receive its final expression which all men may understand. It is within the province of every government to promote economic policies, and this it must do, either for weal or for woe. The leaders of the people must be protected and encouraged—protected from injustice and encouraged by due reward. As their operations have a profound effect upon the progress and welfare of mankind, this effect must be promoted by the establishment of justice to all. The four fundamental laws of economics for which governments are responsible are these: (1) Reward must be secured to the leaders; (2) protection must be given to leaders; (3) justice must be secured to their followers, and (4) welfare must be secured for all.

The four maxims of good government require for their operation some method of securing wise and good men to carry on the government in all its departments. We have already seen that ancient society selected its leader by the methods of the pure democracy. There came a time when these methods broke down because of the great numbers of persons embraced in the body politic. Then the world tried a new plan of government by creating an hereditary aristocracy with hereditary kingship. This system also has failed. Now the effort to secure good government as representative government is undergoing trial. The theory of this method of government is fundamentally that of representation by election, but perhaps the principles of representation are inadequately understood.

Let us try to formulate these principles. Fundamental or

primary representation should not extend beyond the boundaries of the primary units of government. These are townships, or wards, and the governing officers of these units should be elected by the citizens of the several units. In the secondary units, or counties, electors should be chosen by every township or ward composing the county, and they should select county rulers or city rulers where counties and cities are coterminous. In the third unit, which is represented by the state in this country, the county electors should choose the state ruler. In the fourth or grand unit, which is the nation, the county electors should choose national electors, and the national electors should choose the officers of the general government. This, it is believed, would perfect representative government.

The rights and duties, or the theater of operations of the several units of government, should be defined; that is, township rights, county rights, state rights, and national rights should be jealously guarded and strictly observed.

History has already demonstrated that the government can not safely be intrusted to an ecclesiastical body. History has already demonstrated that the government can not be intrusted to an hereditary body. History has already demonstrated that the government can not be intrusted to a purely democratic body. The advanced nations of the earth are now making the experiment of intrusting government to a representative body, and it would be wisdom to consider how a representative body may be best chosen.

The history of mankind has been the constant theme of the ages, because it has been the subject in which men are most deeply interested. Especially has the rise and fall of nations, the rise and fall of dynasties, and the part which individuals have played in such affairs been the theme most attractive. Notwithstanding this fact, the outlines of history as they have heretofore been presented have consisted largely of a more or less bare statement of events in chronological order. Universal history has therefore been treated as annals. Special writers have attempted to treat of the different parts of history as the succession of causations, but universal history has rather

been a compendium of names and dates. Since the establishment of some of the laws of evolution and the overthrow of the ancient doctrine of degeneracy, a new impetus has been given to history, and now a multitude of men are engaged in scientific research, having in view the discovery of the progress of mankind by revealing the causations involved. For this purpose the world is ransacked for the vestiges of human culture in all of the pentalogic departments of the humanities. Historics as a science is thus disclosing a vast body of facts relating to the evolution of pleasures, industries, institutions, languages, and opinions.

Hitherto we have considered only the nature of institutions, in attempting to set forth the four fundamental stages to be observed in their consideration. The course of history in the evolution of institutions is the best nucleus about which to gather the data of progress in the other departments of history. The sketch we are attempting will not permit of any exhaustive treatment. We must content ourselves with only a brief reference to the evolution of pleasures, industries, languages, and opinions.

The four stages of esthetic culture are well represented in the fine arts, which are music, graphics, drama, romance, and poetry. The course of this evolution we have already set forth to the extent necessary to this argument. We have shown that the stages of development in music are rhythm, melody, harmony, and symphony. In graphic art they are outlining, relief, perspective, and chiaroscuro. In drama they are dance, sacrifice, ceremony, and histrionic art. In romance they are beast fable, power myth, necromancy, and novels. In poetry they are personification, similitude, allegory, and trope.

The four stages of industrial culture we have shown to be the hunter stage, the agricultural stage, the artisan stage, and the machinery stage, by setting forth the transmutations which these agencies have produced in society.

In like manner we shall briefly revert to four stages of culture in languages, and also in opinions, and shall attempt to correlate them with savagery, barbarism, monarchy, and

republickism. It hardly seems necessary to call attention to the concomitancy of the five fundamental elements of culture, but simply to affirm that they are connate and that there can be no pleasure without welfare, and no welfare without justice, and no justice without expression, and no expression without opinion.

Ethics

There is a fallacy in the reasoning of primeval man which has produced what has come to be known as the ghost theory. The notion of consciousness as a reified property independent of the body is the first-born of those fallacies which constitute the foundation of metaphysic. But primeval man did not discriminate consciousness from cognition; so that the fallacy was rather the notion that organized consciousness or mind has existence independent of the body. So mind is reified and given a subtle tenuous body that can enter or depart from the material body.

To understand the origin of this notion we must first discriminate between inference and cognition, and then realize that cognition is verified inference and that there is no cognition without verification. Then we must understand that inference is the selection of a concept from memory with which to compare a sense impression. The consciousness of the sense impression and the consciousness of the concept are both attributes of self. Hence inference is the comparing of a psychic effect on self with a psychic memory of an effect on self, to discover whether this cause is like that cause. It thus happens that the self is taken as the standard of comparison in every inference. The objective world is thus gauged by the subjective world. This doctrine in which man is taken as the measure of the universe is known in science as anthropomorphism. In the individual it is the interpreting of the objective world by concepts of self, and as men communicate concepts to one another in the race it is the interpreting of the nonhuman universe in terms of the consciousness of man.

If we understand the nature of inference and its dependence on verification to become valid cognition, we are prepared to

understand the origin of the ghost theory by unverified anthropomorphic inferences which produce fallacies.

The fallacies at the foundation of the ghost theory are the fallacies of dreams. The notions of dreams are thus responsible for the primitive doctrine of a ghost as a reified property. In dreams we traverse the regions of space and witness strange scenes and take part in wonderful deeds and have astounding emotions.

That the notions of dream history are reinforced by the psychic phenomena of ecstasy, hypnotism, intoxication, and insanity, we have set forth elsewhere. That such dream notions seem to be verified by certain phenomena of nature we have also shown, and need only to allude to shadows, reflected images, and echoes. Altogether this fallacy is deeply implanted in the savage mind; it continues as a notion even in the minds of some of the most intellectual men of modern culture. In savagery the notion is that all bodies animate and inanimate alike have ghosts; the theory is then called animism. The relic of this theory in modern culture is the belief that all animals have ghosts, or, still further specialized, that only human beings have ghosts.

The ghost theory has played an important rôle in the development of ethics, which we will try to unfold.

In savagery, life and mind are attributes of ghosts. Material bodies are supposed to be inert, while to the ghostly bodies is attributed all action. Rocks, waters, plants, and stars, as well as animals, have ghosts. It is to ghosts that all purposes are attributed, and all powers to accomplish purposes inhere in the ghosts of material bodies. All of the good and evil which befall savage men are thus attributed to ghostly beings.

Dancing, music, and feasting are the superlative joys of savagery, and the joy is an attribute of ghosts. Pain also is the attribute of ghosts. Ghosts seek pleasure and avoid pain. It is universal in the primitive stage of society to seek for good and to avoid evil through the agency of ghosts. This motive leads to the organization of shamanistic customs which constitute the religion of the people to secure superlative good and to avoid superlative evil. The motive of primitive religion

is the longing for superlative happiness, and it remains as the motive of religion in all stages of culture. Religion is thus a theory or doctrine of securing happiness. The happiness desired may be in the immediate future or the remote future; it may be for time or it may be for eternity, or it may be for both time and eternity. If we are to understand the nature of religion we must always conceive it to be a system of securing superlative happiness. The motive of religion is the gain of happness, and the methods of religion are the methods of obtaining happiness.

We are now to explain what methods of securing superlative happiness are devised in savagery.

Esthetic joys are the primary pleasures. Such joys are founded on the pleasures of physical activity; not the activity of labor itself, but on social activity. The dance is the primeval ceremony of religion; connate with it is the joy of feasting, so that both feasting and dancing constitute connate religious ceremonies that are universal in savage society. The festival is a religious ceremony of savagery. Preparation for the highest enjoyment of the festival is often found in the practice of fasting, so fasting becomes antecedent to festival. The pleasures of love naturally arise through the social pleasures of the festival and are often added. Therefore superlative happiness consists in the revelry of the festival.

Days come and wants are renewed. Plenty brings joy, but hunger brings pain. The memory of want is the mother of fear. The experience of hunger is the primitive motive to industry, but industry has precarious rewards in savagery. The hunt may be in vain. The tree may not yield its fruits. The savage seems forever to be the victim of chance. The seasons come with heat and cold, with sunshine and with storm, and these vicissitudes press upon the savage a load of care and thought, for good and evil are dependent on the changes of nature. Over this nature he seeks to gain control. Primitive man knows of control only as control of motive. The ghosts of the world must be controlled in the interest of the people of the tribe. Ere he has learned to plant he attempts to allure, and before he attempts to control he attempts to

propitiate. He would secure happiness from the ghosts of the world by tempting them with the superlative joys of which he is himself conscious. So he attempts to influence ghosts with festivals, and to hold audience with the ghosts by charming them with the highest pleasures of which he has knowledge. Not only is the festival an assemblage of people, but it is also an assemblage of disembodied ghosts who take pleasure with them.

The steps of the dance are controlled with the rhythm of music. Thus music and dancing become associated. Ghosts also love music. Music and dancing attract the ghosts to the festival and inspire in their tenuous hearts the highest gratitude. But how can ghosts best exhibit this gratitude to men? To accomplish this the forest dwellers devise methods of talking to ghosts, expressing their wants, revealing their intentions, and alluring to beneficent deeds. So ways are devised for communication with ghosts by gesture speech and illustration. In savagery a religious ceremony is a text of prayer with illustrations—prayer in gesture speech and illustration in altar symbols.

In every savage tribe a place of worship is provided, which is also a place for the assemblage of the people in council, in social converse, and in amusement. Then an altar is provided. An altar is a space on the floor or a table on which the paraphernalia of worship are exhibited. They consist of various things designed to symbolize the objects of prayer. Perchance the people pray for food; then corn, acorns, portions of animal food or parts of animals that are held to represent them are placed on the altar. With tribes that collect grasshoppers for food, grasshoppers are used and grasshopper cakes are displayed. With tribes that cultivate maize, ears of corn become the emblems of desire, and ears of many different colors are selected to typify abundance. Then jewels of quartz and garnet and turkis and other precious stones are displayed to signify that the prayer is for well-matured grain, hard like the altar jewels. In arid lands they pray for showers and paint symbols of clouds upon altar tablets and provide flagons or ewers of water which they sprinkle in mimic show-

ers with wands made of the feathers of birds. Birds are also associated in their minds with the planting time and with the harvest time, and they make images of birds, carving them of wood and painting them with brilliant colors, or they make their bodies of fragments of cloth and decorate them with feathers. The birds are then placed upon perches and the perches are placed upon the altar. Many are the devices to represent animal food.

The similitudes and associations which are suggested to the savage mind are utilized in this manner in many a quaint way. The "correspondences" which the sylvan mind discovers and invents to utilize in prayer speech would delight the heart of the mystic.

Having provided an altar with its holy objects, the devout shaman pours forth his praises to the ghostly divinities and invokes their aid in controlling the sunshine and the storm, chanting in established forms of speech and prescribed reiterations. As the prayer proceeds, at definite moments the appropriate symbols are displayed and symbolic actions are performed, all designed to illustrate the prayer.

Such are the prayers of the sylvan man, designed to secure superlative happiness. The ceremonies are performed periodically at appropriate seasons, and that they may not be neglected calendric systems are devised. These are painted on tablets of wood, on the tanned skins of animals, or on the walls of the house of worship, the calendars designating in some symbolic manner the time of the year when certain ceremonies are to be performed, the appropriate ceremonies for the time, the deities to whom the ceremonies are performed, and the characteristics of the ceremonies themselves.

As primitive music has a religious motive, so primordial carving and painting have a religious motive. In like manner the first dramatic performances are religious, all designed to propitiate ghost deities and to secure their favors. When this stage of esthetic art as religion is fully developed, men have passed from savagery to barbarism. To rhythm melody is added in music, to outline drawing relief is added in graphics, and to dancing acting is added in the drama. Then terpsicho-

rean religion is developed into sacrificial religion, for in barbarism the altar symbolism is further developed, so that food and drink are sacrificed to the gods. In this stage the ghost deities are believed to enjoy for themselves not only the dancing but the feasting which is offered them.

All of the fine arts have their origin in religion, for in the worship of ghost deities tribal men seek to propitiate them and win their favors. In this effort they exhaust all their ingenuity in the production of music, graphic, drama, romance, and poetry. Tribal music is thus the worship of the gods; tribal graphic, in the same manner, is illustration to the gods; tribal drama is gesture speech to the gods; tribal romance is story about the gods, and tribal poetry is song of the gods; finally, tribal religion is first dancing to the gods, to which is added the feasting of the gods, and at the close of this state of society religion is terpsichorean and sacrificial in its essential characteristics. The practice of religion is no inconsiderable portion of tribal life, and it occupies a large share of tribal thought.

Here we must pause to emphasize the thought that religion has for its purpose the regulation of conduct in such manner as to secure, through the agency of the gods, superlative or perfect happiness. Thus is the conduct of men regulated by motives that although artificial are yet profoundly potential, for the conduct which is thus instigated is held to be the wisest and best for mankind. It is the ethics of tribal men. Ethics is, therefore, a theory of superlative or perfect conduct. If we consider it as conduct, it is ethics; if we consider it as reward, it is religion. Ethics and religion are identical, the one is the reciprocal of the other.

Through the stage of monarchy the king usurps the function of high priest. His courtiers flatter him as the vice-regent of deity, and he strives to be considered in this light. Often self-deceived by adulation he has a profound faith in the sacred character of his person and authority, notwithstanding which religion undergoes further development. The pageantry of kingly courts is the pageantry of religious ceremony. The festivals which are promoted by rulers all have a religious character, and the priesthood constitute a body of men who

are often learned, often devout, often zealous, and often profoundly interested in the good of mankind. Ecclesiastics thus constitute a specialized body of men whose function it is to receive the new born and consecrate them to the higher life of religion. It is their duty to train the youth in the nurture and admonition of religion. It is their duty to admonish and reprove for evil conduct It is their duty to guide men in all the ways of life. When the most important event of social life occurs, they solemnize the marriage and they seek and often exercise the power of controlling marriage relations in the interest of religion; in sickness and in pain they shower comfort and fortitude, and they bear in their hands as offerings for religious conduct the bounties of paradise. When the portal of death is open, kindred and friends are consoled, and the occasion serves to enforce the doctrines of religion. Thus religion, which is a theory of superlative conduct, employs sanctions of superlative potency.

The association of the fine arts continues through the stage of monarchy. Largely their evolution is accomplished through the agency of the priesthood, and men of genius who are devout worshipers contribute their share to the advancement of esthetics, often impelled by religious ecstasy. In music melody and harmony are added by ecclesiastics as an adjunct to temple worship. In graphic, to sculpture and relief perspective is added, impelling the motive of decoration to the walls of the temple. In drama the mysteries of religion still constitute the theme, while to dancing and sacrifice ceremony is added. The drama is no longer the leading element in religious worship, but it becomes an accessory element designed to instruct the people in the mysteries of religion. In romance, to beast fables and power myths tales of necromancy are added. In poetry, to personification and similitude allegory is added, and the themes of poetry are mainly the themes of religion.

Religion itself undergoes marked development. There still remains an element of terpsichorian worship and an element of sacrificial worship, but ceremonial worship is more highly developed, while terpsichorian and sacrificial worship is performed with an allegorical meaning.

Here we must note, as of profound significance, that the fine arts or arts of pleasure are all pursued in the interest of religion. Music, like all the other fine arts, may be made by individuals for personal pleasure, but in tribal and monarchical society the motive which secures excellence is demotic. This demotic excellence inheres in religious ceremonies. In these stages of society the evolution of the fine arts is therefore wholly dependent upon religion. It is thus that religion is practiced in intimate association with the pleasures of mankind, from which it receives the glamor of superlative joy.

Ethics and religion are still identical, for religion as a theory of conduct is still the highest ethics of mankind.

We have yet to portray the evolution of ethics during the social state of republickism. On the threshold of this phase of the subject we must consider the rôle which is played by great leaders in society. This we have already set forth in other departments of sociology, but in the department of ethics, moral leaders are most conspicuous, and by their disciples they are often esteemed divine, and especially do they rank as prophets. About their birth and about their personal history wonderful stories are told, and to their personal agency miracles are attributed. Among the most conspicuous of these great moral leaders, Laotse of the Chinese, Buddha of the Hindus, and Jesus of the Christians are perhaps most revered by the multitudes of mankind. Mohammed has a great body of disciples, though he departed from the course pursued by the others in attempting to propagate his doctrines by the agency of the sword. These personages were all moral leaders who revolted against the ceremonial religion of their times, and as a substitute propounded doctrines of a higher ethical nature. He who would understand the principles of divine ethics must seek them in the teachings of Laotse, Buddha, and Jesus. Our civilization is familiar with the teachings of him who taught moral perfection in the Sermon on the Mount, which has been reiterated, amplified, and illustrated by the greatest thinkers, the wisest men, and the purest characters that have lived in all the history of the Christian nations.

The disciples of these prophets have invoked the aid of the

fine arts, and thus the most exalted of the esthetic pleasures have become associated with their teaching. The sweetest music has still a religious theme. The most beautiful graphic has still a religious motive—that is, an ethical motive. The most thrilling play has still an ethical purpose. The most absorbing story has still a high moral. The most entrancing poem is still informed with the spirit of truth. Music has added symphony to its methods; painting has added chiaroscuro; drama has added histrionic representations; romance has added the delineation of consequences for moral conduct, and poetry has added trope.

Religion also has developed another stage which demands our consideration:

Moral concepts propagated by teaching and assimilated by acception are affiliated to the notions already entertained; hence great prophetic teachers are not able to diffuse their doctrines in their purity, they can only propagate them in a modified form.

Concepts are propagated by cross fertilization, from which new varieties spring. To propagate fruits with their essential characteristics we must resort to cuttings; but concepts can not be propagated as cuttings, but only by fertilization. Thus moral concepts in the process of diffusion are modified. It is impossible in society to start a new stock of concepts. Moral opinions can not abruptly be revolutionized; they can only be developed. The past can not be ignored by the present; the present is ever modifying the past. Healthy change must be evolution, not revolution, though there is an element of revolution in all evolution. Something must be overthrown that evolution may be accomplished. The individuals of a species must die that new species may be developed, but the new species must be the offspring of the old.

The great moral teachers and prophets have never succeeded in establishing a principle of ethics in all its purity as conceived by themselves. The notions of ceremony developed during the stage of monarchy were modified by the teachings of the prophets, so that a ceremonial religion was developed into a fiducial religion in which the ceremonies are considered as effi-

cient agencies of teaching; but the essential nature of ethical conduct is held to inhere in the opinions which men entertain. Ethics is a faith, and hence we call this stage of ethics fiducial. Men must entertain the opinions believed to be wise that they may gain that superlative happiness which is the reward of conduct.

But how shall men know the good from the evil conduct? By what criterion shall men be guided in the affairs of life? Here a threefold standard is erected. The first is the teaching of the ancients, the second is the teaching of the priesthood, the third is the voice of conscience. These three authorities are supposed to coincide in producing valid concepts of good and evil.

Conscience is the instinctive impulse to moral conduct. To understand this statement we must explain the origin of instincts. Instinct is to the emotions what intuition is to the intellections. Intuitions are habitual judgments of intellect, as instincts are habitual judgments of emotion. As intuitions become hereditary, so instincts become hereditary. The substrate of instinct is the choice exhibited in affinity. In the human mind the affinity of the several particles is organized as an apparatus of choice with a nervous system of ganglia, nervous fibers, and muscular apparatus which consists of a hierarchy of instruments of activity, otherwise called self-activity.

The habitual exercise of this apparatus in any particular method results in the production of habits which, on becoming hereditary, are called instincts. An instinct is inherited not as a developed habit, but as a tendency and facility to do or act in a definite manner. In common life these instincts are observed on every hand. The instinct to partake of food is inherited as an aptness and developed as a practice; so the instinct to walk is inherited as aptness and developed by practice. The instinctive fear of serpents is inherited as an aptness and developed by practice, so that children as well as adults easily acquire the fear of serpents and express this fear and repulsion by acts of fright and avoidance. The fear of fire is easily and speedily developed.

There thus exists a tendency in the human mind to moral

conduct and to inhibition of immoral conduct. This tendency is called conscience. Every human being is thus endowed with conscience as an instinct or hereditary aptness to act in a moral way. There are many other habits that are instinctive, and other instincts may control the individual while the moral instinct is held in abeyance. The moral instinct, like all the other instincts, is inherited only as an aptness and must be developed by exercise. Conscience can be cultivated only by the moral sentiments which the individual entertains. The sentiments of good and evil are governed by the knowledge of truth and error; that is, the emotions are fundamentally governed by the intellect, although the emotions may in like manner govern the intellect, for intellect and emotion are cooperative in every act of life.

The knowledge of good and evil follows hard upon the knowledge of truth and error. In the economy of nature the intellect is first the servant of the emotional life until by its high development it becomes the master. In the ethics or religion of man in the scientific stage of culture the knowledge of good and evil will depend upon the knowledge of truth and error. Then conscience will be an infallible guide; thus conscience becomes the ultimate criterion. Ethical conduct is conduct sanctioned by conscience. The ideal of religion has ever been the control of conduct by that agency, although other sanctions have been employed. Conscience is the child of religion and evolves as religion evolves, and religion evolves as the intellect evolves.

Such are the characteristics of the religion or principles of ethics inherited by the moral teachers of modern times—teachers who flourish in the atmosphere of science. Among these there is a goodly number of moral reformers; in fact, as a class they are all moral reformers, some preaching against this evil, some against that; some exalting this virtue, others exalting that.

The moral teachers of the times are more and more eschewing the ancient doctrines of theoretical ethics and devoting their energy to practical ethics. Theories of faith are held in abeyance to theories of practice. It needs but a few genera-

tions to come and go before the new teaching of theory will be founded wholly on principles derived from practice. This will be the establishment of scientific ethics.

The agencies of religion are multifarious; the teachers of religion are potent. The organization of institutions of religion are all progressive. They have not to be overthrown, but only to be perfected.

We have identified ethics with religion. The teachers of religion may have erred in theories of ethics, and they may have been instrumental in the enforcement of ethical doctrines by unwise agencies. Some of these agencies have been of a character utterly revolting to modern concepts of good and evil conduct. Usually the religion taught has been the religion believed, though hypocrites have often nestled in the fold. The claim for superior conduct and for the sanctity of its teachings has enticed bad men into the ecclesiastical ranks. Above all, and more than all, the establishment of an official priesthood as one of the functions of government and one of the aristocratic estates has been the cause of abuses and horrors in the name of religion for which the student of ecclesiastical history must forever blush.

As astronomy was developed from astrology, as chemistry was developed from alchemy, as medicine was developed from necromancy, so ethics is the lineal descendant of animism. Purified from animism, religion will remain forever to bless mankind.

Having set forth the nature of ethics, it now remains to classify its subject-matter in compliance with the pentalogic qualities.

It is believed that the classification will occur to every attentive reader and that its fundamental nature is evident. It is necessary, therefore, to state the classification without further elaboration. The subject is grouped into (1) the ethics of pleasure and pain; (2) the ethics of welfare and want; (3) the ethics of justice and injustice; (4) the ethics of truth and falsehood; (5) the ethics of wisdom and folly.

It is the province of ethics to teach perfect character by promoting conduct governed by principles instinctively enter-

tained as conscience, so that all acts are spontaneously good. Such conduct is purely ethical.

In the science of economics we find that self-interest is subserved by promoting the interest of others. In the science of institutions it is discovered that justice for self can be obtained only by doing justice to others. Rights may be obtained by performing duties. In the science of ethics we learn that all conduct, egoistic and altruistic alike, must become spontaneous and habitual. Habitual conduct thus spontaneously controlled has its sanctions in conscience. Ethics, therefore, is the science of conduct controlled by conscience.

PHILOLOGY, OR THE SCIENCE OF ACTIVITIES DESIGNED FOR EXPRESSION

Introduction

The fourth group of arts in the scheme hitherto presented in this journal consists of the languages which men devise to express their thoughts. Every art has its foundation in nature, for art arises through the attempt to improve on nature. Activity, as we have defined it, or self-activity as it is often called in psychology, is the primeval expression of animals by which their thoughts are interpreted by other animals. This primeval activital expression assumes a new phase under development, when it is known as the language of the emotions. In fact, primitive activital expression is the germ from which all other kinds of language are developed.

All nature is expressive, but activital nature is especially expressive of mind. Thus activities constitute a natural language expressing the minds of activital bodies, but such expression is not designed to be understood by others; it is therefore not conventional, and therefore not artificial. Natural expression must be distinguished from artificial expression or language, for natural expression is not designed to convey concepts, while expressions which are designed to convey concepts constitute language. Hence language may be defined as the artificial expression of concepts in judgments by words in propositions.

Natural methods of activity are themselves indicative of thought which others may interpret, but when activities are conventionally produced for the purpose of expression and are interpreted as such by others, language is produced. The producer of the speech implies the interpreter of the speech, and the two by custom come into a tacit agreement or understanding by which the language becomes artificial as conventional. So language may again be defined as an activital movement designed to convey thought to others.

It may be well to reexamine briefly the nature of activital movement, although the subject has more elaborate treatment in my former work entitled Truth and Error. Movements in the animal body are performed by muscles. The muscles are found in opposing pairs, or more or less in opposing groups, which have the function of contracting and relaxing, and one may contract while the other relaxes, and thus originate a movement in the animal body. The contraction and relaxation are produced through the agency of metabolism. When metabolism is constructive it is called anabolism, when it is destructive it is called catabolism. I suppose that catabolism produces contraction and that anabolism produces relaxation, but of this I am not sure. Certain it is that when muscles are contracted and relaxed, metabolism in both its methods is involved, so that all muscular action is founded on metabolic action, and metabolic action involves affinity, which is choice, as we have heretofore deductively demonstrated. The movements in animals which depend on muscular action due to the function of opposing muscles, one of which relaxes and the other contracts, we call activity. Activity is under the control of the will, for the individual animal controls activity indirectly by controlling the metabolism of molecules. It is thus that activity is innate in every living animal body.

Emotional Language

The natural expression of strong emotion is cultivated by man in the earlier stages of society and likewise in childhood, so that an artificial language of the emotions is produced. Thus we have in laughter the language of joy, and in weeping the language of grief, each highly expressive of emotion.

To man who already uses language in its highly developed state, it may seem at first blush that laughter is a purely natural ebullition of joy, but on further examination he will see that it is no less artificial and conventional than the term joy itself; yet it is probably universal with mankind and is an expression inherited from his anthropoid ancestor. Those species nearest allied to this anthropopithecus indulge in laughter, and even squirrels chatter in a manner exceedingly suggestive of laughter.

Of what emotion laughter is the expression in its purely natural state we are left to conjecture. Let us assume, as seems probable from the little evidence we have, that it was the expression of joy, for it has this meaning with the species allied to anthropopithecus. Then came a time when laughing was conventional, as being designed for such expression that others who heard might understand it in this manner; then laughter became true language as we have defined it. Used at first with difficulty, it speedily became easy, and becoming easy it gradually became habitual, and finally instinctive by inheritance. The nature of this process can well be illustrated by citing the case of screaming, of which we will treat a little later. Even laughter is consciously used with designed expression, as when we laugh at things which are not amusing to us out of courtesy to others, when its original nature becomes apparent.

In treating of emotional expressions it will serve present purposes to speak only of one meaning for each expression; thus we speak of laughing as an expression or word of joy, but laughter, like all words in spoken or written language, has many meanings; in fact, emotional signs are especially characterized by multifarious meanings; for this reason emotional language is highly ambiguous and a ready tool for deception.

Smiling as an expression of pleasure. In smiling we have an expression of an emotion, less intense than that of joy, which may best be called pleasure. In laughter the muscles about the mouth, especially the risorius, are contracted, as also are the orbicular muscles about the eyelids. The group of muscles involved may be called the smiling muscles. The smile needs no further description. It expresses pleasure in a great variety of meanings, and it is clearly seen to be artificial, whether the approval be genuine or assumed.

> "I set it down
> That one may smile, and smile, and be a villain."

Weeping as an expression of grief. In weeping tears flow and various muscles about the eyelids, especially the orbiculars, are involved, for through their agency tears are produced.

The expression of sorrow is also found about the corners of the mouth, which droop. All the muscles that take part in the expression, and there are many, may be called the muscles of grief. Those naturalists who are also psychologists explain the origin of weeping in the irritation to which the eyes are subject from smoke, dust, or other foreign particles and from scratches and blows. Primitive man seized upon this natural effect of discomfort to artificially produce weeping in order that he might express grief to others. Thus weeping became a linguistic sign, and a linguistic sign is a word in the generalized meaning of the term. Weeping is expressive of many emotions; hence the word has many meanings. Like all other signs of emotion it may be used in the practice of deception.

Sobbing as the expression of despair. Sobbing is caused by sudden or spasmodic inspiration and is accompanied by the facial signs of grief through the action of the muscles of grief. Habit has made it instinctive, but its true nature as an artificial sign is plainly exhibited when sobbing is simulated.

Screaming as a sign of command. Screaming is common to many of the lower animals, both mammals and brutes; it seems to be universally used by the young as a cry for help and is thus subject to the will. In the human infant the instinct of screaming is exhibited before that of weeping. It is probable that all generations of human beings and generations of remote prehuman ancestry practiced the art. In the human being it is a cry or command for relief, and is so interpreted by every mother. Thus a cry has evolved into a word.

Bodily attitude as a sign of anger. The emotion of anger, which is naturally expressed by striking, has many concomitants. In the infant it is accompanied by kicking and the general activity of the body which may be called squirming. This general activity causes a determination of blood to the head, so that the angry person becomes red. Another accompaniment of anger is the assumption of an attitude of belligerence, when the form is held erect, the hands are clenched as fists, and the arms held akimbo. With the adult, striking and kicking are often inhibited, while there yet remain the attitude and the flushed face. This attitude is a true linguistic

sign and hence a word. Sometimes the anger is expressed by simulated kicks, but usually this expression is one of contempt. Among some of the lower races the expression of striking is with the hands, for they are more accustomed to slapping than to fisticuffs.

Showing the teeth as a sign of rage. Rage is a more intense anger, and to the sign of anger is added an additional element which is earlier than that sign. Brutes fight mainly with their teeth, and express their anger by showing their teeth, especially their canines; they also express anger by bodily attitude, and finally they express it as an artificial sign by erecting the hairs of the body, especially around the head and neck, thus causing a show of great size and strength. There remains with the more evolved man the sign-word of exposed teeth, in which the canines especially are displayed, as a habit inherited from the brute. It is thus that the more intense anger which we call rage is artificially expressed by man in an exhibition of the teeth, and perhaps in grinding them together.

Compressing the lips as a sign of determination. The compression of the lips as a word expressing determination or fixed purpose is universal among mankind. In origin it probably expressed the meaning, "there is no further word to be said." If so, its meaning has gradually changed. With this meaning it has become habitual and hereditary, so that the expression is made when the determination is made, without conscious intent to express this meaning to others; yet it is still used with this intent when we wish to simulate determination.

Frowning as a word of disapproval. Disapproval is expressed by frowning, which as a sign has become an artificial word. No word of emotional language is more common or more readily understood, and yet it is not devoid of ambiguity. It is expressed by the eyebrows through the corrugator muscles. But as these muscles are used in many other signs there is an element of uncertainty in its interpretation.

Many other activities are used for expression. We may mention a few more without discussing their origin. They are, averting the head as a word of disdain; shrugging the shoulders as a word of doubt, hesitancy, or helplessness; raising the

eyebrows as a word of surprise; turning the eye without averting the head as a word of warning; beckoning to approach; beckoning to depart; beckoning to keep silence; beckoning not to move; nodding assent; shaking the head in negation.

The principle of antithesis has been potent as an agency in the development of emotional language, as from its nature it is the expression of judgments about qualities. Qualities are always antithetic. This is one of the characteristics by which they are distinguished from properties and quantities. Darwin, in his Emotions in Man and Animals, abundantly demonstrates this principle.

In a subsequent article we shall attempt to demonstrate that the emotions are fundamentally and properly classified as feelings, enjoyments, affections, understandings, and sentiments.

Oral Language

INTRODUCTION

One method of expressing emotional language has been developed as oral speech. The characteristics of this method peculiarly fit it for development in the first stages of human culture. The organs of speech can be used when the organs of locomotion and manipulation are otherwise employed. This characteristic serves a double purpose: it is advantageous to the maker of speech, and it is also advantageous to the interpreter. In visual language the interpreter must have his attention preadjusted thereto, while in order that it may serve his purpose the maker must also see that attention is paid. The conditions for conveying speech are superior in these respects to those for conveying visual language. Doubtless this advantage led to the development of speech in advance of the development of gesture language.

With the development of speech the organs with which it is produced were evolved until an apparatus was constructed capable of making with precision the differentiated sounds of speech and music, and of combining them into syllabic successions and the syllables into polysyllabic words. Doubtless

the experience of very many generations was necessary to the production of the apparatus, and without doubt it can be affirmed that oral speech itself was developed in many of its essential characteristics during the process.

From study of the speech of birds we are led to conclude that the primitive speech of man was probably exclamatory, and that the first words were designed as warnings, calls, invitations to mates, and other simple expressions. To these were then added pronouns which served both demonstrative and personal functions. The *I*, the *you*, and the *he* probably subserved the purpose of the *here*, the *there* of you, and the *there* of him, for which specialized cries were developed even as they are among the lower animals. Such cries may best be called exclamations; thus the exclamation is the first part of speech. It is a verb or word of the imperative mode in being an exclamation, and it is a noun in being a pronoun. In this stage parts of speech are undifferentiated, for every word serves the purpose of all parts of speech. Refined distinctions of thought and refined distinctions of expression were not as yet.

From observations of child-language and from observations of bird-speech it seems probable that inflections or glides of the voice from higher to lower keys constitute the primitive method of differentiating the meanings of such words. Then, perhaps, adjectives of good and bad were developed, not as adjectives, but as asserters of good and evil. They were thus verbs as adjectives and as asserters. Thus pronominal verbs and adjectival verbs may have been made ere the organs of speech were fully developed for the expression of well-differentiated sounds. Words of a simple character were made with undifferentiated meanings, of undifferentiated sounds, by undifferentiated organs. Thus far we may legitimately go, guided by the phenomena of bird-speech and child-language. To trace the evolution of oral language beyond this stage we must depend on vestigial phenomena.

To set forth the characteristics of oral speech it will be found advantageous to explain the evolution of its characteristics as found in the higher languages. For this purpose it becomes necessary to explicate the elements of oral speech. These ele-

ments are (1) sounds, which give rise to the science of phonics; (2) vocables or words, which give rise to the science of lexicology; (3) the use of words in sentences, which gives rise to the science of grammar; (4) the derivation of words one from another, which gives rise to the science of etymology; (5) the significance of words, which gives rise to the science of oral sematology.

PHONICS

The advantage which sound possessed over other elements of emotional language caused it to be much used and thus to be highly developed. In the process of this evolution special organs of speech were produced. Vocal speech thus became universal with mankind. In the passage of air through the throat by inhalation or expulsion, sounds are emitted by means of the vibration of the vocal chords, which sounds are made in great variety by lengthening or shortening the chords and by passing the air with greater or less force. Another class of sounds are produced by the modification of breathing with the lips, teeth, tongue, palate, and nostrils. The consonants may be classified in this manner.

With such a complex apparatus, subject to the will of the speaker, a great variety of consonantal and vowel sounds may be produced. In the practice of ages the undifferentiated sounds made by primeval man are gradually specialized. This specialization pertains more to the consonants than to the vowels. A peculiarity is found in these consonantal sounds, for in the different languages particular differentiations occur more or less characteristic of them severally, so that a language may often be distinguished by its consonants. One language may be remarkable for its development of labial sounds, another for its development of dental sounds, another for its development of lingual sounds, another for its development of nasal sounds, another for its development of palatal sounds.

Again, languages may vary in being more or less vocalic—that is, the speakers may resort more or less to the vocalic sounds as compared with the consonantal sounds. Again, there are certain sounds that are intermediate between vowels and

consonants, and these may prevail to a greater or less degree in different languages. It is thus that the vocal apparatus of sound used to express speech in voice is capable of producing a great number of different sounds when we consider all the languages of mankind. On the other hand, when we consider the sounds of any particular language we find that only a limited number of well-differentiated sounds are used. Perhaps two or three score of such well-differentiated sounds will be discovered. If for any language we wish to represent every sound by a distinct character, the problem is more easily solved because the number of sounds to be represented is thus restricted. Should we wish to represent all the sounds of all the languages by distinct characters, so that one character will stand for its special sound and no other, the problem is not so easily solved. The characters, then, are far more numerous.

Very much practice and great painstaking are required to discover the sounds of an unknown tongue. The speech of one man differs from another in the emission of sounds, even though they may have a common language. There are thus innumerable slight differences in the sounds produced in the same language by different persons, but habit interprets them according to a common standard which is established by vocal and written spelling. The habit thus formed of interpreting the sounds of the language to a conventional norm renders it very difficult to interpret the sounds of an unknown tongue. It is thus that students of the lower and unwritten languages use very different characters, because they interpret the sounds of such languages by assimilating them to the sounds with which they are more or less familiar; and there are instances in which the same person will interpret a sound as one thing and then another by its associations, and even in the same word the sound will have a double interpretation on different occasions or when used by different persons. There are certain characters used to represent sounds in which this liability to misinterpretation is common. Such are the sounds represented by *l* and *n*, the sounds represented by *p* and *b*, and even by *p*, *b*, and *w*. In one language related sounds may not be differentiated, and the synthetic sound produced will then be interpreted in vary-

ing ways. It is thus that the student of the phonics of many languages will always have a perplexing problem to solve.

Primitive languages are widely separated from one another. As they are now found they are already evolved into a high state of complexity and special sounds are developed in every one, for the centuries during which they have been spoken can not be enumerated. Some languages are more highly evolved than others, but there is no reason to believe that one tongue has its roots more deeply embedded in antiquity than another. Surely no philologist would dare to affirm that the roots of one language are more ancient than those of another.

The philologist may compare a language as it is spoken now with the same language as it was spoken in some ancient time, and he may also compare a less developed language with the ancient stages of a more highly developed language. In doing this he may speak of a current language as if it were antique; but we must understand by this not that he affirms greater antiquity for the language, but that he affirms for the methods of the lower language a state of evolution revealed in the ancient forms of a highly developed tongue.

LEXICOLOGY

I use the term lexicology to denote the science of vocables or words. The dictionary and the thesaurus illustrate two methods of assembling words for use. By one they are arranged alphabetically; by the other they are arranged classifically with an alphabetic key. The science of words is pursued in both of these methods, and I call the study of words the science of lexicology. It will be seen that this science is well differentiated from the other sciences of language, although it can not dispense with phonology, grammar, etymology, and sematology, for the elements of language are concomitant.

For dictionaries the alphabetic arrangement of words is not only convenient but necessary to their utilization. A classification of words by their meanings is a very difficult task which has never been accomplished in any perfect manner, and yet such a classification, to which an alphabetic key is appended,

is very useful to the scholar who is careful in the selection of his terms.

A vocable is a succession of sounds that are emitted in a prescribed order. This constant order by much repetition establishes a habit of emission which integrates the word and distinguishes it from other words. Thus an habitual succession of sounds constitutes a word. In sentences words are used also in succession, but the successions are variable and hence they do not integrate by habitual expression. In sentences the variability in the order of expression is an agency by which the sounds are prevented from coalescing; in words the invariability produces coalescence, so that we may define a word as a succession of coalescing sounds. The degree of coalescence is variable, and the degree of the separation of words in the emission is variable. Thus words may be of more than one syllable and yet the syllables may be distinct in a minor degree, while the words of a sentence flow into each other so that one sentence may be distinguished from another, but the separation of words is more distinctly marked than the separation of syllables.

In the production of words from sounds idiosyncrasies prevail which are peculiar to the different languages severally. In one language certain sounds will not coalesce with certain other sounds to the extent necessary to the formation of a word, but one or the other of them will be modified. Facility in the combination of sounds into words is thus variable from language to language.

GRAMMAR

Grammar is the science of arranging words in the sentence. Sometimes it is called syntax. Grammar is held to include other of the elements of language, but we have already seen that the elements of language are concomitant, and one can not be considered without implicating the other, and often overt affirmation is necessary. The word and the sentence may be identical units; that is, a word may be a whole sentence. In some languages most sentences are but single words. In the examination of the many languages spoken by

mankind they are found to differ from one another in the degree in which they construct monovocable sentences. It may be affirmed that the greater the prevalence of monovocable sentences the lower is the language in the scale of culture.

The characteristic which we have here described has been called by various terms, as synthesis, polysynthesis, or encapsulation—using as a figure of speech the inclosing of boxes, one within another, in the order of their size. Perhaps it will be better to use the term coined for the purpose by Lieber. He calls such languages "holophrastic," and a word-sentence may be called a "holophrasm." Bird sentences seem to be holophrasms, while some bird songs may be sentences composed of more than one word. In child speech we discover that the first words spoken are sentences. We may thus conclude that the primal speech was holophrastic.

We must now set forth the manner in which speech is developed from the primitive holophrastic condition to that which has sometimes been called analytic, but which we will here call organic. The terms synthetic and analytic are misleading in that they implicate fallacies, hence we have selected the terms holophrastic and organic as they will better convey our meaning.

The organs of a sentence are the parts of speech of which it is composed. We must therefore deal with the parts of speech.

In words the office of assertion is fundamental. This office is often called predication. Attempts have been made from time to time to group the things which can be asserted or predicated, and they have been called predicaments. In that stage which we have reason to believe to be universal in the lowest culture all the offices of words are performed by one holophrasm. I say to an offender, "Go!" I mean by the expression, You, the offender, and I further mean to assert a command that he leave my presence. All of these things are implied in the word *go*. The word *come* may thus be used. So we may use a great variety of imperative verbs. In like manner all adjectives may be used. In savage languages

adjectives may be conjugated as verbs in the different voices, modes, tenses, numbers, and persons. We have in English many so-called verbs which are in fact adjectives used as verbs in this manner. Participles and adjectives are one in office; only difference in office constitutes different parts of speech. In all verbs the office of assertion still remains in the words. Words which still retain this office are called verbs, whether they express action or not; that which is essential to the part of speech which we call a verb is the office which it performs as an asserter. When the verb *to be* is used as an asserter it is a more fully differentiated verb. All other verbs are less differentiated, for they perform other offices in a greater degree. In the expression "I hear," *hear* is both an asserter and an adjective. The two offices may be differentiated by using two words, "I am hearing," *am* being the asserter and *hearing* the adjective. Even yet *am* is not a fully differentiated asserter, for *am* also conveys the idea of first person, singular number, and present tense.

The degree to which the offices of words are specialized is variable in different languages, and it is also variable in different ways of expression found in the same language. The verb often contains in itself the elements of the holophrasm, which may or may not be repeated in the sentence, when the verb is said to agree in such characteristic with its subject or even with its object, using these terms in their grammatical sense. This is a characteristic of the classical languages. Such tongues give duplicate expression to ideas, and hence require duplicate efforts of thought and expression.

The evolution of modern languages out of languages in which holophrastic methods prevail has as its essential motive economy of thought and speech. This is obtained by the atrophy of methods of agreement. When number is expressed in the noun, in the adjective, and also in the verb or asserter, the number must be considered three times and expressed three times. The greatest economy is yet not all told. When such methods of expression are replaced by organic methods, and only one word is used to express the number, it is found that in the vast majority of cases the purpose of the speaker is

better accomplished by omitting to express the number. It is thus that in a perfectly developed organic language it is possible for the speaker to give his attention exclusively to the expression of the thought desired, and he need not detain the locution to consider and express multifarious inconsequent details. Why should a person in speaking of a ship be compelled to think of its number, its gender, and its case every time he uses the word, or the verb with it, or the adjective with it, when such particulars are of no consequence in the narrative?

The varying of forms of words to express particulars about the thing of which the word is a name is called inflection. The classical languages are thus highly inflected. The modern languages which have developed from the classical stage are more thoroughly organic. Yet men with linguistic superstitions mourn the degeneracy of English, German, and French without being aware of the great improvement which has been made in them as instruments for the expression of thought.

All words are names, and names are used in sentences for the purpose of making assertions. A sentence consists of a subject, an asserter, and an object. The subject is that of which something is asserted. The object is that which is asserted of the subject, and the asserter is that which predicates the object of the subject. In the science of language subject and object are terms used in a different sense from that in which they are used in psychology. Sometimes the sentence is said to be composed of subject and predicate, in which case the asserter and the object are considered as one; but this habit involves an error in the discrimination of the offices of words. It is fundamental to the sentence that the three offices should be performed.

The offices of words in sentences, as distinguished from their meanings, are as subject, asserter, and object; but as we call the asserter a verb we may say that the primary parts of speech are subject, verb, and object. Then there are subordinate parts of speech. The subject may be qualified, limited, or defined; we shall call the words which perform this office adjectives. The verb may also be qualified, limited, or de-

fined; that is, the assertion may be affirmative, negative, or conditional; we shall call the words which perform this office modals. Again the object may be qualified, limited, or defined; we shall call the words which perform this office adverbs. Thus the six parts of speech are the subject, verb, object, adjective, modal, and adverb.

The grammars of the higher languages have hitherto been constructed on the theory that the classical languages were the proper standard of comparison, but in English certainly there is a tendency to construct grammar on the theory that the standard of comparison must recognize the subject, the asserter, and the object, which are then treated as defined or modified by subordinate elements. Already this change has made much progress, for practical teachers find that the elements of grammar when considered in this manner are far more simple and lend themselves better to intelligent instruction.

ETYMOLOGY

Etymology is the science of the derivation of vocables or spoken words. Human cries are probably the elements from which words are derived, and words have been evolved therefrom by the gradual differentiation of specialized sounds as the apparatus of speech has been developed.

That words may serve the purpose for which they are designed in expressing concepts they must be enunciated by the speaker and heard by the person addressed. In making and receiving the sounds of speech the persons who are in daily association cooperate, so that the development of speech is a demotic process, for words must not only be spoken but heard, and they must be informed with thought if they convey thought. In tribal life, which is the earliest society, the tribe constitutes the body of persons by whom a language is developed.

We shall hereafter see that in this state an intertribal language is evolved which involves other methods of speech not produced by the vocal organs. This intertribal language is gesture speech. Gesture speech thus seems to be the normal language for intertribal communication so long as tribes remain distinct.

In the evolution of social groups one tribe coalesces with another. Some tribes develop their numbers to such an extent that they fall apart and no longer actively cooperate in the development of oral speech. The coalescing of distinct tribes or of fragments of distinct tribes is one of the great agencies in the evolution of language. Distinct tongues render mutual aid in the process. The language originating in this manner is compounded, and a wealth of synonyms is produced which readily take on specialized meanings highly advantageous, particularly to people who extend over a wide area of country in search of food or impelled by a desire for barter, and especially is it advantageous for tribes or portions of tribes that migrate to new habitats. In early society migration is a potent agency in the evolution of language. New scenes originate new thought, and new thought promotes new expression, and the new expressions are most readily learned from new tongues. It is thus that the vocables of a language are multiplied as synonyms by the coalescing of distinct languages, which words ultimately have specialized meanings.

This process has been continuous among mankind. Small tribes have become great tribes, and tribes have become nations, and nations have been absorbed by nations until the multitudinous tongues spoken in savagery have been greatly reduced in number and the tongues spoken by the developed nations of civilization have become few in number. This is the grand factor in the evolution of language, thoroughly attested by the history of civilization, for the tribes of savage and barbaric people are found with a much greater diversity of tongues than the peoples of civilization.

New thoughts come with advancing culture. The words by which the new concepts are expressed may be new words from new languages, but often, and perhaps usually, the new thoughts are expressed by the old words. It is a slow process by which the new thoughts are expressed by differentiated words derived from distinct tongues. When new meanings are desired, some modification of the old words is made. In this manner one word is derived from another. Languages integrate by coalescing and differentiate words as parts of speech by derivation.

With advancing thought new concepts arise. For these new concepts new words may be coined, or the synonyms of coalescing languages may be used; but the usual method is to use an old word with a new meaning; this leads to duplicate meanings of words. In every language words have many meanings. If the words of the English language were multiplied so that one word should have but one meaning, and if synonymous words were reduced so that one meaning should be expressed only by one word, still the number of words in the language would be multiplied several fold. Duplicate meanings give rise to ambiguities, for the speaker may use a word with one meaning and the hearer may interpret it with another. There is a mechanical habit of using words by which many fallacies are produced in logic. That pseudo-science which is known as formal logic is provocative of these fallacies, for formal logic is a system of reasoning with words rather than with things. When we remember the number of distinct meanings with which words are conventionally endowed, it is not surprising that such fallacies should spring up; but it is surprising that they should be used from generation to generation and from century to century, so that fallacies of antiquity should still survive.

The rules for deriving one word from another differ in the different languages, but the method of deriving one word from another is universal. There is a mnemonic advantage in knowing the derivation of a word. Wishing to express ideas, the words are more easily recalled for deft expression through the laws of association, and words which are unfamiliar may be recognized by recognizing the elements of which they are compounded.

In the early history of the European nations the literature of Hellas and of Rome played an important part in human culture, for the Latin and Greek languages were the repositories of the thought to which scholarly men most resorted, and learning itself was dependent on these languages; so that learning was often considered as the acquisition of the language rather than as the knowledge of the thought contained in the literature of the language.

In the derivation of new terms with the progress of culture, resort was had to these classical languages for the new terms which were needed, and scholars developed a system of rules which were expressed or implied as regulations for the derivation of new words. One of these rules was a prohibition upon the compounding of words from the elements of two languages; thus Greek and Latin elements should not be compounded in one word. As many of our words are not immediately derived from Greek or from Latin, the same rule was sought to be enforced with them all, and the words not compounded with the authority of these conventions were considered to be barbarous or unscholarly. Most new words are not produced by scholars, but by the common people in everyday speech, and thus a commonplace dialect is produced which scholars are ultimately forced to adopt in order that they may be popularly understood. Yet there is a sentiment, whether well-founded or not, against the coining of new terms from other tongues than the Latin and the Greek, and against the mixture of different linguistic roots. Sometimes these conditions are carried so far that the new term must be made according to the methods practiced in the Greek or the Latin at some particular time in the history of those languages.

Comparing those languages which exhibit the most highly differentiated parts of speech with the languages of savagery, we are able to discover the course of evolution in the past, and we may with some confidence predict their further evolution and even surmise the outcome—that is, the nature of the ideal language to which all languages are tending. The vast integration of tongues which has already been accomplished tells of a time when there will be but one human language as oral speech, and the state which will be reached in the specialization of parts of speech may be stated as a surmise in the following way:

There will be primary and secondary parts of speech. The primary parts of speech will be the subject, the verb, and the object, which will be distinguished as words. The secondary elements will be definers. The definers of the subject will be adjectives, which will be words, phrases, or subordinate sen-

tences. There will be modals to define the asserters for the purpose of distinguishing affirmation and negation and all conditional modes of assertion; these modals will be words, phrases or sentences. There will be adverbs to define the objects; these also will be words, phrases, and sentences. We may conjecture that to such a stage the parts of speech will be differentiated, guided by the motive for economy in thought and expression.

SEMATOLOGY

Sematology is the science of the signification of oral words and sentences. In considering this subject it becomes necessary not only to consider the significance of words, but also the development of the significance. "Words are signs of ideas," or, as we say, words are signs of concepts. It is fundamental that we recognize bodies as such by their properties, and cognize properties as good or evil for our purposes as qualities. The nascent mind speedily learns by experience that different properties inhere in the same body. The mind thus posits or implicates the existence of one property when it cognizes another. The bodies of the world are cognized by the use of the five senses, every one of which primarily deals with a special property. The senses in highly developed man, though fundamentally devoted to a distinct property, have become highly vicarious, so that one sense seems to cognize all of the properties. The origin of this vicarious action of the senses is founded on the concomitancy of properties, for in cognizing a property we recognize other properties. In the developed mind every act of cognition is also an act of recognition; it is an act of cognizing one property and of recognizing others. This may be stated in another way: When we cognize a property we implicate the existence of other properties. All this has been set forth in another volume, but it requires restating here that we may properly understand how the meanings of words are produced.

The first words were calls, then came demonstratives, then adjectives of quality followed. Things were called by such names as "the sweet," "the bitter," "the high," "the low," "the fierce," "the gentle"—so the qualities were parceled out to

things as their names. Researches in the etymology of the lower languages to discover the roots of words seem to lead to this conclusion. Not only were bodies named by their qualities, but properties also were named by their qualities. As gradually the qualities of things were discovered, quality names were differentiated; then property names were differentiated, and then the names of bodies themselves were differentiated. In savagery every property is known as a quality and is called by a quality name. Even the sunset is read as a beautiful color, a hue of rejoicing, instead of as the result of the rates of vibration revealed to the scientific student of light. Properties are known as qualities in savagery. Various properties are found in the same body, and the names by which they are called may stand for the body itself. Thus every body may have a variety of names depending on its properties conceived as qualities. The discovery of this characteristic is the first contribution made to the science of language through the study of ethnic or tribal languages. Max Müller, with characteristic deftness and scholarship, was, so far as I know, the first to clearly propound this doctrine. He seems to have derived it from a study of the appellations of the deities. Surely it was Max Müller who caused it to be accepted as a law of philological science. The same deity can be invoked by many names, and can be praised in varied speech; and when another god is addressed, many of the same terms can be employed. The substrate of this custom is found in the concomitancy of qualities and properties. Every god in savagery is the wisest and the best betimes, and every god has superlative attributes. The evolution of the meanings of words must first be considered as a development in knowledge by the discovery of new qualities, and new properties must be considered as qualities, because of their concomitancy.

In primitive society the discovery of new bodies is ever in progress by a law of mind. As they are discovered they are affiliated to those already known and described in terms of the known. When experience finds it desirable to discriminate, the terms of expression are gradually differentiated, and thus new methods of speech arise. In savage society the tend-

ency is to produce a holophrasm by modifying the old. As a linguistic phenomenon, classification is thus an agency for the development of speech. By classification the same body may have different names. Thus, while the same body may have different names by reason of its different properties, it may also have different names by reason of the different classes to which it belongs in the hierarchy of classes. In this manner names are greatly multiplied. Again, by evolving culture, things previously unused come to be utilized and are given names which also signify their uses, so that names are multiplied by utilization. Meanings undergo corresponding evolution; the impulse for different meanings becomes the impulse for different names. This is general; the purpose gives rise to the expression.

The confusion which arises from the failure to distinguish consciousness from cognition, or the workings of the mind due to the organization of the nervous system from the substrate of mind as exhibited in all bodies even without organization, led to the theory of ghosts. This theory, which has also been called animism, induced savage men to personify all bodies. The personification in savagery was developed into similitude which is fully evolved in barbarism. In this stage of society a multitude of similitudes are found which in a later stage give rise to allegory, a variety of which is parable, and finally allegory is developed into trope. The meanings of words are multiplied by this agency, for the same word may have different tropic meanings, or, as it is often expressed, words may have figurate meanings. The giving of words figurate meanings is founded on the concomitancy of properties, and is developed in a multitude of ways all through the course of culture until it appears in the highly developed language as trope.

Here we may pause to note the fallacies of reasoning which are developed by the figurate meaning of words—fallacies so subtle that, although discovered by the ancient philosophers, who failed not to give their warning, they have yet been the bane of logic exemplified in all metaphysical literature. *Form* is the Anglo-Saxon term by which internal structure is desig-

nated, but as the internal structure gives rise to the external shape, both structure and shape are expressed by the term *form*. A spoken word is a succession of sounds. By a figure of speech we speak of the spoken word as a *form*, meaning thereby a succession which is an element of time, not of space. This usage is convenient, but it must be carefully distinguished when we reason, for the confusion which arises when a time succession is confounded with a spacial series is such a fallacy in science as to be disastrous. In psychology contiguity in time and contiguity in space are often confounded, especially in the discussion of the laws of memory.

The term *form* is sometimes used with a figurative meaning in other ways, as when we say "the *form* of an argument," meaning thereby the *constitution* of an argument, or the order in which the averments occur. In this sense every argument has a form; but it is not the form of space—it is the form of succession or time. When the argument is committed to writing, the letters may have forms as the sounds have succession; but the letters not only have forms, they also have successions. In the same manner written sentences have forms as well as successions. In this fact there is another source of obscuration in the use of the term *form*. Rightly understood it is proper, but if neglected it is a source of fallacy. In philosophy it is better to use the term *form* only to express structure and shape as they are found in space.

The story of the confusion of meanings in the use of the term *form* is yet but imperfectly told, for there are many derivatives of the word, as *formation* and *formative*. We may use the verb *to form* in any of the senses of "to make," "to produce," or "to generate." Sometimes we may be considering only the spacial form, but when we are considering some other topic the word is used in a sense which may give rise to confusion. I may combine oxygen and hydrogen and produce water, and I may say that oxygen and hydrogen *form* water, when I mean that they produce water, or that the combination of the two substances results in water. The use of the term in this manner is convenient and rarely leads to misapprehension; but when in science we use the term *form* out of

its spacial significance, philosophy is apt to degenerate into metaphysic.

We might go on to set forth the use of *form* and its derivatives in other senses than that of spacial form, and still the subject would not be exhausted—not even in a great tome. Words in English derived from languages other than the Anglo-Saxon are subject to the same confusion of meaning. Morphology is the science of form, and yet the term is used as the name of a journal which deals mainly with the genesis and evolution of plants and animals, and which treats of the forms of plants and animals in but comparatively insignificant degree, for it is devoted mainly to the genesis of function. Metamorphosis is used not only to signify change of form, but also the change of all other properties.

This habit of using words with figurative meanings leads to bad reasoning. Spencer, in the first volume of The Principles of Ethics, presents a masterly chapter on the relativity of pains and pleasures. Here, in the use of the term *absolute*, he distinguishes it from the relative by properly implying that what is relative must also be absolute. The same act is absolute as an act, though relative in its consequences.

Subsequently in his work Spencer sometimes uses *absolute* in another sense. Thus he speaks of "absolute ethics," meaning thereby conduct perfectly or superlatively ethical, and he uses the term "relatively ethical" to mean imperfectly ethical. No harm would be done by the use of the words in this manner did he not use a doctrine which he had previously developed about the absolute and the relative in ethics, as if he had demonstrated the same doctrine about the perfect and the imperfect in ethics; hence his consideration of perfect and imperfect ethics is vitiated.

Please permit the expression of an opinion about the origin of a fundamental fallacy in Spencer's Principles of Ethics: He fails to discover the true nature of ethics and its origin in religion, primarily by the failure to discriminate between perfect and imperfect on the one hand, and absolute and relative on the other; hence he confounds ethics with justice. The principles of justice are evolved under the sanctions of

legal punishment, while the principles of ethics are evolved under the sanctions of conscience. Of course a discrimination of words must follow upon the discrimination of meanings, but the habit of using words with different meanings is apt to prevent the proper evolution of concepts.

Knowledge increases by the discovery of new bodies, new properties, and qualities. As new concepts are added in this manner, new methods of expression must be coined. The first method is by asserting the existence of the new thing; after a time the new thing is given a name. It is the habit of modern science to give this new name at the time of the discovery, but in work-a-day life this is not common, and a name must be developed by experience.

We have next to describe a method of developing the meanings of words which has not only been universal but has also been very efficient. This method has been called a "disease of language." When a fog settles over the coast, it may sometimes be seen as a cloud of moving vapor; at other times it may be seen to descend as fine drops of rain, when it is described as a "long-stemmed" mist by seafaring folk. In the same manner I have heard the shower which is composed of very large drops of rain to be described as a "long-stemmed" storm. Let this method of expression become habitual to a people and the term *long-stemmed* will become an adjective descriptive of storms. Then the different words will coalesce and drop some of their sounds, and there will be an adjective descriptive of storms as "long-stemmed." Again, a storm of rain may be called a "long-stem," and the connotive meaning may be lost and the denotive meaning remain in common comprehension. I have known sailors to speak of a storm as a "long-stem." It is reasonable to suppose that the term long-stem might be used in this manner: As we may say of a man who is characterized by his fits of anger that he is a "storm," so we might say of such a man that he is a "long-stem," until an angry man might habitually be called a "long-stem." The "disease of language," as it has been called, is thus the specialization of sentences into words, and the use of connotive terms as denotive terms.

Literary men are forever giving new meanings to old words.

Lang, in the first volume of Myth, Ritual, and Religion, says, "It is 'a far cry' from Australia to the west coast of Africa." We have only to suppose that the term *cry* becomes a measure of distance as the term *foot* was developed, and that the term be used only in this sense, while other synonyms are used in what is now the ordinary sense, and we have a fine illustration of this phenomenon.

What has been called a "disease of language" is the substitution of a word to express a new meaning and the atrophy of the old meaning.

THE ARYAN PROBLEM

In the study of the languages of the earth we find in a general way that the more primitive the culture of the people the fewer are the people who speak a common tongue and the greater are the number of distinct tongues. By a world-wide review of this subject we reach the conclusion that every tribe in the beginnings of human speech spoke a distinct language.

We can not pause to completely assemble the data on which this conclusion is founded, but it seems that a language as an art of expression was originally developed by every distinct body politic. The persons who habitually associated as a body of kindred developed a language for themselves. Thus in thought we have to view an ancient condition of languages when every tribe had a tongue of its own and hence that the number of languages was approximately equal to the number of tribes. Languages thus commenced as a babel of tongues.

If we investigate the modern development of any one of the languages of higher civilization we find its elements to be compounded of many diverse tongues. What we know by historical evidence we are compelled to infer as true of all existing languages, and in fact no language—not even that of the most savage tribe—can be intelligently studied without discovering evidence of its compound character.

We must now call attention to the process of evolution of languages in which they are integrated—that is, they are forever becoming fewer in number. They do not multiply by evolution; they integrate. With this process of evolution, languages forever differentiate more thoroughly specialized

tongues; they also differentiate more thoroughly specialized parts of speech, and they also integrate and differentiate meanings. The process of evolution in language, therefore, is the integration of distinct languages and the differentiation of more specialized elements.

Many of the nations of Europe and America speak languages which are held to be cognate, and thus most of the more highly developed languages of the earth are said to belong to one family. These tongues are called Aryan. Linguists have devoted great labor and profound scholarship to the task of discovering a primitive Aryan speech on the theory that this supposed ancient common speech has been differentiated into the tongues of the Aryan nation, the theory being that of a single people inhabiting some limited locality in Europe or Asia. Opinions that were held of the degeneration of mankind gave rise to the theory, and scholars began the research by assuming degeneracy of speech, and by assuming the multiplication of tongues with the lapse of time. Research which has been pursued with so much labor and learning has failed to discover either the land or the people, but has forever resulted in the discovery of more and more diverse elements in the speech of the Aryan nation until few scientific linguists remain to speak of the separation of the Aryan tongues.

The course of history has been continuous in the integration of languages, and no language can be found at the present time that is not a compound. Through this compounding of languages many tongues of to-day have common elements, and the higher the language the more diverse are the elements that have been incorporated. Yet men will still seek to solve the Aryan problem!

Gesture Language

Gesture language, like oral language, has it foundation in natural expression and emotional language. In the earlier history of speech it was ancillary thereto, and yet as language it remained more rudimentary and hence it retained more of the characteristics of natural expression. As tribes developed speech independently, every one for itself, gesture language,

which still retained many of the characteristics of natural language, became a means of communication between tribes having diverse tongues. The gestures themselves, though remaining largely natural, gradually became somewhat developed conventionally. Notwithstanding these artificial elements, gesture language in all history has been characterized by great crudity, and it largely resembles emotional language because both of them are akin to natural language. The gesture language which is found in tribal society was replaced by written language, as we shall hereafter show; but new gesture languages have from time to time been devised for use by those unfortunate people who have been born deaf or who have by disease been rendered deaf. Therefore the nature of gesture speech is learned from the study of two distinct examples—the languages of intertribal society on one hand, and the modern languages of deaf-mutes.

While intertribal languages are founded on natural expression, and while some of the deaf-mute languages also are founded on natural expression, others of the latter have a more highly artificial or conventional structure. When the sounds of spoken words are represented by manual signs, or the letters of the alphabet are represented by finger-wrought signs, then gesture language itself consists of signs for signs, the vocal signs themselves standing for concepts. This form of gesture speech is therefore very highly conventional.

It is not consonant with our present purpose to further enlarge on this topic; it is necessary only for us to mention gesture language as one of the pentalogic series that the complete series may be exhibited.

Written Language

Modern written languages differ from speech in that sounds are represented by letters. Letters, therefore, are signs for signs. When we study the history of the origin and growth of written language we find that it does not always use the method of representing sounds by written characters. In the Chinese, for example, the written characters have no reference to sounds as sounds are analyzed in phonics. Thus the Chinese have no alphabet. When we come to investigate the

origin of alphabets we are led into a vast field of research in which we find that alphabets have a long history as picture writings anterior to their development into alphabets. In tribal society all written language is picture writing, used mainly for religious purposes. The pristine picture writing was a means of communication with the gods and a method of record necessary for the proper observance of religious ceremonies, and especially of the time when such ceremonies should be performed. Thus the chief picture writings of tribal society are calendric.

In the lower stages of society, when spiritual properties are held to live a distinct existence from the other properties of bodies, so that animism universally prevails, then ghosts are invoked for the purpose of gaining their assistance in the affairs of human life. The oldest differentiated calling in society is that of the shaman—a man who is supposed to have skill in communicating with ghosts. He who makes a profession of ability to communicate with ghosts is called in various languages by various terms that we now translate as *shaman*—a term derived from the early study of the Africans along the Guinea coast. The shaman is thus a man who claims to hold linguistic intercourse with ghosts. The shamanistic profession is practiced in every tribe, and it is through invention by shamans that picture writing was devised, and it is further through their invention that picture writing was developed into alphabetic writing.

It will be equally interesting and instructive to contemplate the origin of picture writing. It is common in savage society to hold periodical festivals with fasting, feasting, music, dancing, dramatic performances, and athletic sports on the occasion of making invocation for abundant harvests. There are many other occasions for like festivities with all their accompaniments. One example will suffice to set forth the nature of the picture writing displayed on these occasions, and we will select for this purpose a calendric festival of rejoicing after the harvest-home which is also a prayer for future good harvests.

The festival to which I am now to refer was continued through several days. At one time the shaman and the mem-

bers of the shamanistic society over which he presided were gathered in a kiva or underground assemby hall where midnight prayers were made for abundant crops. On this occasion the customary altar was arranged with the paraphernalia of worship. Among other things were wooden tablets on which were painted the conventional picture writings for clouds and lightning, below which were the conventional signs for raindrops, and below the raindrops the conventional signs for growing corn.

In order more fully to understand these picture writings we will mention some of the other objects placed on the altar. There were wooden birds painted and placed on perches; there was a ewer of water about which ears of corn were placed; there was a case of jewels—crystals of quartz, fragments of turkis, fragments of carnelian, and small garnets; then there was a bowl of honey upon the holy altar. When the shaman prayed he asked that the next harvest might be abundant like the last; he prayed that they might have corn of many colors like the corn upon the altar; he prayed that the corn might be ripened so as to be hard like the jewels upon the altar; he prayed that the corn might be sweet like the honey upon the altar; he prayed that the corn might be abundant for men and birds, and that the birds might be glad, for the gods love the birds represented upon the altar as he loved men. Then he prayed that clouds would form like the clouds represented upon the altar, and that the clouds would flash lightning like the lightning on the altar, and that the clouds would rain showers like the showers represented on the altar, and that the showers would fall upon the growing corn like the corn upon the altar—so that men and birds and all living things would rejoice.

In savagery and in all barbarism such festivals are very common, and much of the time is occupied in worship. In savagery worship is terpsichorean, and in barbarism it is terpsichorean and sacrificial, and in both stages of society all amusements are religious. So in tribal society all time devoted to amusement is religious. The ceremonial festivals are held in regular order through the seasons from year to year. For this purpose a calendar is devised in weeks and

months, when the days of the year are numbered in a hierarchy of weeks and months. The number of weeks in a month and the number of months in a year vary greatly. The months and years are counted off and the seasons are indicated by the appearance of stars as signs of the zodiac. Now, these numbers, together with the signs of the zodiac, are arranged in calendars, and the principal events of each festival are recorded under the calendric signs or picture-writings. Great ingenuity is needed to symbolize the principal events of the festival. The season of the festival and the events of the festival are all recorded in picture-writings until the shaman becomes deft in picture language. The records which have been discovered among tribal men are usually called codices. They are recorded on various things, such as papyrus, fiber of the maguey plant, birch-bark, and the skins of animals; especially are calendars painted on the walls of temples.

These records made from time to time through century after century become very highly developed. When a concept is given a sign it becomes more and more conventionalized until its character as a picture is lost. In this stage a curious phenomenon is observed. An ideoglyph is read as a word instead of as a pictorial event. This is the stage in which Chinese writing is to be seen at present. Now, when a glyph is read as a word, the interesting phenomenon of which we have spoken is this: Words have different meanings, the same word may express different concepts, and the glyph may be read by speaking the word and attaching to it any meaning which the spoken word represents. In this early society words are mysterious things supposed to be properties or qualities of things, rather than signs of things. When such glyphs become signs of spoken words they are signs of sounds. They become signs of word-sounds, then signs of syllabic sounds, and ultimately signs of alphabetic sounds; and thus picture-writing is developed into alphabetic writing.

In the higher civilization written language is founded on alphabets as spoken language is founded on sounds; but primitive written languages do not consist of graphic signs designed to represent sounds. The written languages produced in primitive time have distinct words as ideographs; they also have a

distinct grammar for the arrangement of these glyphic words unlike that of highly developed written language. Etymologies also take a different course; thus, in the Chinese, the etymology of glyph words is highly complex and is upon a distinct and peculiar plan. The sematology of the language represents the culture of the people who employ such a written language. On the other hand, in fully developed written language alphabets represent sounds, while letters are arranged in words and the words in sentences. The etymologies of the written words correspond to the etymologies of the spoken words, while the sematologies of the written words also correspond to the sematologies of the spoken words.

Logistic Language

The fifth language of the series now requires characterization. In the earliest and best developed condition it is found as the language of enumeration. Here numbers are represented by graphic characters which have been called digits, because originally the fingers of the two hands were used as an abacus for counting, and the written numbers represented the fingers—the nine vertical strokes for nine fingers and a cross stroke for the tenth. Ultimately the ten strokes were developed into ten figures which are still called digits; the tenth digit is called a cipher, and in order that it may be significant it must be read as ten times some other digit; thus one with the zero is read as ten, two with the zero is read as twenty, etc. A hundred is represented with a one and two ciphers, two hundred by a two and two ciphers. Hence units of different orders are recognized. A constant ratio exists between one order and its next higher, which is ten, because the original abacus for counting was the ten fingers. As this linguistic system had its beginning in a number system, we call it logistic speech. There have been developed many tables of measures for quantities of various kinds; thus there are the long-measure table, the square-measure table, the cubic-measure table, the dry-measure table, the liquid-measure table, various weight-measure tables, various time-measure tables, etc. These are all examples of logistic speech, which were

developed out of ideographic writing into a language of more universal application.

The highest development of this language which yet exists is found in the science of mathematics, which has a plus sign, a minus sign, a multiplication sign, a division sign, an equality sign, a root sign, and many others—we will not go on to enumerate them because they are many and so well known that the few will suggest them all. The science of astronomy has also developed an elaborate logistic language, the science of chemistry another, and the science of geography, the science of geology, the science of botany, and the science of zoology have all developed something of a logistic language. A logistic language is also developed in many of the arts; especially is music thus written.

The essential characteristic of logistic language is that its sematology is universal, so that the meaning of any character depends on the meaning assigned to it by the user—it is the special language of reasoning and avoids all ambiguities of other languages due to the multifarious meanings of single words. There is no source of error in reasoning which compares with the fallacies of diverse meanings, but science constructs for itself a special language which obviates this evil.

The grammar of this language is yet unwritten, for the language has scarcely been developed to a sufficient extent for the purpose. It may be that when logic is wholly emancipated from metaphysic, logicians will devise a grammar of logistic language. Perhaps they will then call it the grammar of logic, and what I have called logistic language will be called logic. All that is valuable in the so-called logic will remain as component elements of a grammar—a grammar of the science of reasoning with language. Logic is the science of reasoning with language, and logistic language is the language of reasoning.

We have thus seen the nature of emotional language, oral language, gesture language, written language, and logistic language. The five fundamental sciences of philology are thus briefly characterized, and the nature of philology itself is set forth in its pentalogic elements, which I deem to be inclusive of all and severally exclusive of each other.

SOPHIOLOGY, OR THE SCIENCE OF ACTIVITIES DESIGNED TO GIVE INSTRUCTION

Sophiology is the science of instruction. I shall treat the subject under two rubrics: First, the nature and origin of the opinions which are inculcated by instruction, and, second, the agencies of instruction

Opinions, the Subject-matter of Instruction

Opinions are about particles severally or about them conjointly as they are organized into bodies. Particles thus considered are found to have essentials, relations, quantities, properties, and qualities. There are no essentials without relations, no relations without quantities, no quantities without properties, and no properties without qualities, for the world is concrete and there is nothing abstract but in consideration. Essentials, relations, quantities, properties, and qualities we call categories.

When the world is looked upon as concrete, and bodies are discovered, it is found that every one is composed of a group of bodies; but to express the fact without confusion it is better to say that a body is a group of particles, for when one body is considered as a constituent of another it promotes clear statement to say that the compound body is composed of particles. Ultimate particles have never been reached by analysis unless it be in the ether.

Concepts grow as the products of thought. The stream of thought is composed of instantaneous and successive judments, some of which are duplicated and endlessly reduplicated. While mentations arise from sense impressions, like sense impressions are oftentimes repeated and by association past mentations are revived, so that there is a vast repetition of the instantaneous judgments as they follow on through the stream of mental life.

It is thus by repeated and revived mentations as judgments that concepts or notions arise. These notions constitute opinions. We can not make a complete consideration of opinions without considering their origin in the compounding of judgments into concepts.

While opinions often change, they are not necessarily born to die. Correct opinions developed in the individual and propagated from man to man become immortal, while only incorrect opinions ultimately die; but the vast body of opinions as they arise from moment to moment are born only for an ephemeral life. Of those that have appeared upon the stage of history because they have been accepted by the great thinkers, it remains to be said that still the many die and the few live. While they live they are esteemed as science, when they die they are esteemed as errors; hence sophiology can be defined as the science of opinions and their classification as errors or truths when accepted as such by the leaders of human thought, together with the methods of discovering and propagating such opinions.

We are now to consider how opinions originate and change. For this purpose we will consider them in groups in the order in which they were developed by mankind. These groups fall into five rubrics: animism, cosmology, mythology, metaphysic, and science. Animism, which is the belief in ghosts, first prevailed. We will, therefore, consider this subject first. For the original formulation of this doctrine we are indebted to the great ethnologist Edward B. Tylor.

The science of ethnology teaches the nature and origin of the ghost theory; that is, it discovers the nature of ghosts and explains how men come to believe in them. There are many people who believe in ghosts, the opinion being a survival from primitive society, but with tribal men the belief is universal. Ethnology also teaches the nature and origin of primitive cosmology, which has now become discredited, though vestiges of it exist in the opinions of simple folk, when it is called folklore. I have previously set forth the nature and origin of animism and cosmology.

MYTHOLOGY

Heretofore in treating of the fundamental processes of psychology the nature of consciousness, inference, and verification have been set forth. Inference alone may and often does result in error, while truth is assured only by verification. Every judgment involves a consciousness and an inference; and if the judgment is valid, its validity can be established and known only by verification. The repetition of an erroneous judgment is often confounded with verification, and thus men come to believe in fallacies. Of the multitude of errors in judgment those most often repeated by mankind, and especially those which have been coined by the leaders of thought, are those which are woven into mythology. Though we have a criterion by which to distinguish true from erroneous judgments, still judgments are compounded into notions that ultimately are exceedingly complex, and it is often found difficult to resolve notions into their constituent judgments; so that while there is an infallible criterion, it is not easily applied. We are not here dealing with the whole subject of psychology, but only with the leading concepts which distinguish science from mythology. That history of opinions which is often called the history of philosophy (but which is mainly the history of metaphysic), together with the history of science, gives us the data of what is here called *sophiology*. Science has already cost a vast amount of research, and we may safely prophesy that only a beginning has been made. It would be an inane proceeding to attempt to forecast what research will ultimately unfold, but perhaps it would not be unprofitable to review in outline the characteristics of the fundamental errors of mankind in so far as they have already been detected.

False inferences primarily arise through referring sense impressions to wrong causes. A term is needed for this error, and it will be called *imputation*. Imputation, then, is the reference of a sense impression of which the mind is conscious as an effect, to a mistaken cause. This wrong cause may be a wrong body or it may be a wrong property.

Let us now see if these two propositions can be made plain. The savage hears the thunder and infers that it is the voice of a bird. This is imputing a sound to a wrong body. Birds have voices, and not knowing the cause of the thunder, the savage imputes it to a bird; but as he knows of no bird with such a voice, he imagines a new and unknown bird. Thus an imaginary bird is created as the explanation of thunder. The creation of imaginary things to explain unknown phenomena is mythology. Thunder may be interpreted as the voice of a bird in such manner by many people until it falls into common speech. Thus an imaginary thunder-bird may become the theme of much thought and much talk, and at last a number of stories may grow up about it. The barbarian who drives a span of horses to a war chariot becomes accustomed to its rattle and compares it to thunder. Then the thunder itself is symbolized as the rattle of the chariot of the storm. In this case a new imaginative being is created—a storm god with his chariot in the clouds. So the reference of an effect to an erroneous cause results in a myth.

There may be many analogies called up by the noise of thunder, and there may be many myths established in such manner; but it is manifest that none of them can be verified. In the course of the history of verification, which is the history of science, an hypothesis as to the cause of thunder may be verified; when such verification is reached, all myths relating to thunder die as notions, and the scientific concept is established. All false philosophy—that is, all erroneous explanation—must necessarily lack verification. It may be believed and become current in the philosophy of a people or of a time, and this current belief may be held as science; but sooner or later an erroneous notion, however widely believed, will present some incongruity to the developing concepts of mankind and will challenge such attention that new hypotheses will be made to be examined until one is verified. When the verification comes, science is born, and the old notion is relegated to mythology. Philosophy is the explanation of causes; whatever else may be involved in the term, this must be involved. It is the central point in philosophy, though not the whole of philosophy.

We may now make a definition of the growth of science and the discovery of error. Research, by which science grows, is the verification of hypotheses and the elimination of incongruous notions, and such discarded notions as have been previously and generally received as science are relegated to mythology. Let us illustrate with another example.

Conceive a people in such a primitive stage of culture as not to know of the ambient air. Such people have existed and some even yet exist. In all that culture known as savagery this fact is unknown. The air is unseen; but it often has corporeal motion, and is then called wind, and this wind produces effects. Blow upon your hand, or invigorate the fire with your breath, and then contemplate the wind among the trees: How like the breath is the wind! Now impute the north wind to some great monster beast, and you do only that which millions of people have done before. Many savage peoples explain the winds in this manner, imputing them to monster beasts. In this instance, and in ten thousand others that can readily be supplied, the error of imputing an effect to the wrong cause as a wrong body results in the creation of imaginary bodies, which is the essence of mythology.

When air is unknown there are other things besides breath which the wind suggests. You can blow the fire with a basket tray, and you can fan your brow with an eagle's wing. So the wind suggests a fanning, and may be explained in this manner. But what is it that fans? A bird with wings. If the wind fans it must be accomplished by some great sky-bird. The myths of such sky-birds are common. After this manner a host of imaginary animals are created.

To the wildwood man, who roams the prairie and haunts the forest, the world is the grand domicile of beasts. Beasts are men, and men are but beasts. To his mind the beasts are rather superior to men. The beasts have more magical power, and hence are often immeasurably superior to human beings. The savage admires the superiority of the beast and longs for his activities; he is forever contemplating the accomplishment of beasts—the wonders which they can perform—and is envious of their skill in what he supposes to be magic. He sees

the trout dart from bank to bank in the brook and is amazed at its magical powers, and from admiration he often proceeds to adoration. He sees the serpent glide over the rock, swift without feet and having the sting of death in its mouth; in this respect it seems superior to man. He sees the chameleon gliding along the boughs of trees in sport with rainbow hues, and is delighted with its magical skill. He sees the eagle sail from the cliff to the cloud region, at home in wonderland. He sees the lion walk forth to conquer with occult majesty. Yes, all the animal world is magical, and men are but degenerate animals. Inspired with wonder, he is filled with adoration, and the beasts are gods. The world is thus the home of men and gods, and the gods are the beasts.

A mythology has sprung up with every primordial language. These languages are found to be many—how many we do not know, but certainly there have been many thousands, and with every tongue a mythology has been developed. The tribes of mankind scattered over the whole habitable earth between the polar walls of ice, living in small clusters, every one having a distinct language and pouring out the generations that have peopled the earth, have created a host of imaginary or mythic bodies.

One of the methods of reasoning by means of which monsters are produced is imputing to one property that which is due to another. Water is transparent and water reflects the light. These two facts are universally observed in savagery. It is something with which men are familiar as an experience growing from day to day and from hour to hour. There is another fact with which they are almost as well acquainted, namely, that the eye is transparent, and also that it reflects images. The eye is the organ of sight, and it is not strange that the power of vision should be referred to transparency. The reflection of light is an unknown and undreamed property, but transparency is well known, and images are well known, and images appear in vision. Thus, with the Zuñi Indians, as with many of the tribes in North America, the property of transparency is esteemed as vision: all water sees, and the dewdrop is the eye of the plant. It is long before it

is learned that transparency is ability to transfer certain kinds of motion, while vision is a mentation. Thus force as reflection and vision as mentation are explained as transparency.

The mythology of the Amerinds is replete with myths concerning the powers of thought. There is no error more common than that of confounding thought with force. When the savage theurgist tells us that his hero can think arrows to the hearts of his enemies he makes this mistake. So it is believed that there are mythic men who can think their boats over the river; they can think themselves to the topmost branches of high trees; they can think rocks onto the heads of their enemies. There is no myth more common than this one of confounding thought with force, and there is no myth that has a more venerable history. No Egyptian king has received higher honors, for it is embalmed in the cerements of learning.

We now know that heat is a mode of motion and that cold is a low degree of heat; in the same manner we know that color is a mode of motion, and we measure the number of vibrations in the ether that are required in a unit of time to produce a variety of color.

The love of knowledge is the most delightful plant in the garden of the soul. In the individual the failure to make correct judgments entails innumerable evils, while correct judgments lead to good. Judgments directly or indirectly lead to action, and that action is wise as judgments are wise. Every hour, almost every moment of the day, brings the lesson that knowledge is advantageous, and these lessons are repeated by every individual in every generation. Thus there is an acquired and hereditary love of knowledge. Mental life presents a vast succession of judgments, some correct, others incorrect, and as they come they are enwrought in notions that inspire activities, and by these activities the notions themselves are adjudged. Those notions that stand the test are held fast, those that fail are cast away, for men love the true and hate the false. All this is so evident that it seems commonplace, and yet we are compelled to account for the intensity with which men cling to mythology.

The repetition of a judgment is sometimes a valid confirmation, but it is often the bulwark of fallacy. Judgments many times repeated becomes habitual, and habitual errors are hard to eradicate, for they are venerable. Errors associate in communities; as they dwell in the mind they constitute a fraternity for mutual protection. Assail one notion with the club of incongruity and a host of notions arise in its defense. Perhaps this will fully explain the fact, which we are to consider, that men invent arguments to sustain myths. He who contemplates this state of affairs may readily fall into despondency, for there seems to be as much mental activity occupied in the invention of false reasons as in the discovery of truth; but on further contemplation it is seen that science has an advantage in that its gains are constant and imperishable, while the gains of error overstep themselves and sooner or later exhibit new incongruities and hence are self-destructive.

The appeal to antiquity is the appeal to habit, and the appeal to habit is the appeal to repetition, which must always be distinguished from the appeal to verification. The argument from antiquity is a two-edged sword, and may be an instrument of suicide; but it is the first argument used to support a myth. "It was taught by our forefathers" is inscribed on the banner of mythology. But can we not use the argument from experience? Yes, if we distinguish the method of verification from the method of repetition. This is our only criterion.

Myths are defended by another argument which must now be set forth. It may be called the argument from intuition. Plants grow from seeds; animals from eggs. The development of the individual from the germ is called ontogeny. The process of ontogeny has been well recognized from primordial human time. Germs also develop from generation to generation. The acorn is a very different seed from that of the plant from which oaks were developed. The egg of the bird is a very different germ from the egg from which it was developed through successive generations. This development of germs is also called the development of species. The process is now well known to science, but it was long unrec-

ognized except in a vague way. The process is called phylogeny. Ontogeny and phylogeny together are termed evolution. While ontogeny was more or less fully recognized in antiquity, phylogeny was very dimly discerned and it was supposed to be exceedingly restricted; so that while there might be varieties of plants and animals, it was held that all living creatures are encompassed by barriers beyond which they can not pass. It could be observed that plants and animals grow from germs, but that races grow by minute modifications of germs accumulating through many successive generations was not so easily observed. That the offspring is like the parent is a more conspicuous fact than that the offspring is a modification of the parent. Therefore it was believed that every existing species is the descendant of a primal species, and the number of primal species has remained constant. Finally it was discovered that species become extinct and that species begin at different periods in the world's history; this was revealed by the science of geology. Thus the notion of constancy of species was finally shown to be erroneous, and it has been replaced by the scientific concept of the evolution of species.

So much of what is now commonplace science must be given that we may understand the doctrine of primordial intuition, which was invented as a defense of mythology. As plants grow from seeds by minute increments through the process of ontogeny, and seeds grow from other seeds by minute increments by the process of phylogeny; as animals grow from eggs by minute increments, and as eggs themselves grow from other eggs by minute increments, so ideas grow ontogenetically by minute increments of judgments and also phylogenetically by minute increments of judgments. Thus the notion grows in the mind of the child by ontogeny, and the idea grows in the mind of the race from generation to generation by a process analogous to phylogeny. As man once believed that plants are inexorably limited to specific forms that are constant, as he once believed that animals are limited to specific forms that are constant from generation to generation, so men have believed that ideas are limited to specific forms that are constant. That which in plants

and animals was called the limitation of species in ideas was called intuition, and by that term was meant the limitation of certain specific ideas. It was recognized that ideas grow or develop in the individual, but it was denied that they develop in the race. Sometimes it was conceded that ideas or concepts grow phylogenetically, that is, they are developed in the race; but it was held that there are certain fixed limits to ideas or notions which can not change, these limits being fixed primordially in the mind. Now, there have been many modifications and many phases of this doctrine which we can not here elaborate, but that which is essential to all forms of the doctrine of specific innate ideas has been set forth.

We must now see how this doctrine is used to shore up mythology.

Venerable errors are supposed or affirmed to be universal and also to be innate—that the notions which they involve have been preserved from primordial time, and that they were given to man at his creation when all species were created. This doctrine of primordial specific innate ideas is one of the most important themes of scholastic learning. Born in savagery, flourishing in barbarism, it is believed in civilization, and its exposition ultimately becomes one of the tests of scholarship. When the doctrine had reached this stage, so-called philosophers or mythologists attempted to defend these primordial concepts. This attempt culminated in the Critique of Pure Reason. This defense of mythology by Kant led to the usual result; he, or at least his followers, supposed the argument to be exhausted and the question of innate ideas set at rest when it was stated anew as innate forms of ideas. A calmer generation discovered the incongruity of this doctrine with the concepts of evolution born of science. While the doctrine remained vague, these incongruities were not so apparent; but when it came to be carefully formulated, it was doomed. It may be claimed that the doctrine of the evolution of concepts by experience in the race as in the individual is established.

Primarily judgments are formed as guides to action. In this first stage erroneous judgments are detected by the test

of action. If the action proves unwise, the judgment is wrong; but as judgments multiply and are compounded in notions, a new test of error is developed, which is the incongruity of notions. But the discovery of incongruity is not the discovery of the specific error. The incongruity is a relation between two or more notions; some one of these notions must be erroneous, but which one is not revealed by the incongruity. The error is discovered only by submitting the judgments to trial by verification. The incongruity does not reveal a particular error, but only the fact that some error exists; on the other hand congruity does not prove validity.

Mythologic notions may well be congruous with one another. There is no incongruity between the notion of the thunder-bird and the notion of the wind bird. If there is a bird which roars in the heavens, there may be a bird which breathes in the hurricane; the one notion serves to confirm the other. It is strange how congruous mythic notions are with one another. Study the mythology of any people as a system, and you will be surprised at the congruity of the notions which it reveals. Compare one mythology with another, and often they will be found strangely antagonistic. This congruity of mythic concepts in one system is a fact so conspicuous as to challenge the attention of thinking men, and it is early discovered and widely used alike in savagery, barbarism, and civilization.

This method of reasoning from the congruity of notions was finally developed in early civilization into a body of doctrine called dialectic. By this doctrine any mythic notion could be expounded as a starting point and other mythic notions brought into judgment before the one selected and found to be congruous, and by this logic proved correct. Proceeding in this manner from notion to notion, many are verified, and the assumed original notion is in this same manner found valid. It is thus that a special system of reasoning in the interest of mythology is gradually developed.

If this system of logic were not already named, I should be tempted to call it Kanosh logic. Kanosh was the chief of a Shoshonean tribe in the central part of Utah, where cinder-cones and lava-beds are found. In years of my youth I was

wont to sit at the feet of the venerable Kanosh and listen to mythic tales. Once on a time he explained to me the origin of the cinder-cone and the scarcely cooled lava which in times past had poured from it. He attributed its origin to Shinauav—the Wolf god of the Shoshonean. When I remonstrated with him that a wolf could not perform such a feat, "Ah," he said, "in ancient times the Wolf was a great chief." And to prove it he told me of other feats which Shinauav had performed, and of the feats of Tavoats, the Rabbit god, and of Kwiats, the Bear god, and of Togoav, the Rattlesnake god. How like Aristotle he reasoned!

There is a phase of the defense of mythology which must not be neglected, although its contemplation is a source of sadness because it is an exhibition of the worst traits of mankind. It has already been seen that in the defense of mythology subtile arguments are produced, systems of psychology are born, and methods of logic are invented. The notions of mythology are not only woven into theories of institutions, but institutions are devised for their propagation and defense.

Institutions are founded in the natural conditions of family organization. The love of man for woman and the love of woman for man, together with the love of parents for children and children for parents, are all involved; thus institutions have their origin in domestic love. The social life which develops from this germ, having its roots in domestic love and sending its branches into all the ways of life, constitutes the sheltering tree to protect mankind from the storms of foreign war and internal conflict. Peace, equity, equality, liberty, and charity are concepts at the foundation of institutions. An attack upon institutions is thus an attack upon all these sacred principles, so man defends them to the last extremity. On the other hand, men are constantly seeking to improve them, and that which is beneficent to one may be malign to another. When the tendrils of mythology are entwined in the branches of institutions, the attempt to substitute science for myth often appears to be an attack upon the institutions in which it is entwined, and thus the reformer and the defender come to blows. When the defender of venerable mythology is also the defender of

ancient institutions, he is easily convinced that his warfare is holy. When he is the constituted and official defender on whom the armor is buckled and by whom the sword is grasped, he is watchful and ready for the fight. Then his honor is at stake and his emoluments threatened.

One element of this controversy—the saddest of all—is the passion for thaumaturgy which mythology produces. Then unknown beings with occult attributes people the world, and the air reeks with mystery. Men who deceive themselves are deft in the deception of others. The love of thaumaturgy becomes one of the monster passions of mankind that stifles the pure love of truth. When thaumaturgy becomes a source of gain, and greed is wed to wondercraft, there springs from the union a progeny of devils that wreak on the teachers of truth the tortures of rack and fagot.

In savagery names are believed to be natural attributes of the objects which they signify. The many significations which the same word may have are usually related to one another, but even when they are not related they are so habitually associated that affinities are constantly suggested. The development of science to an important degree depends on the distinct recognition of different meanings, and in order that scientific reasoning may proceed it is always found necessary to define words with exactness and to adhere to constant meanings; but mythological reasoning does not observe these precautions, and often succeeds in making its arguments plausible by the uncertain use of words. It must not be supposed that this is a device on purpose to deceive, for it is often a potent agency of self-deception.

Trope is not an unmixed evil, although it is a dangerous device. When knowingly used and legitimately derived it adds power and vigor to language, and we have already seen that it is a necessity in nascent knowledge. Ultimately it becomes the foundation of the highest fine art known to man, for it is an essential element in poetry; but that which is legitimate and useful in poetry is the bane of scientific reasoning, especially when it is used without comprehension. Mythology is thus eminently tropic. While it is held as science, its tropes

are believed; when its incongruities are discovered and its tropes are recognized, mythology is often supposed to be a crude poetry. When dialectic methods of reasoning prevail, equivocal or duplicate meanings of words are common. At last mythologic reasoning discovers the advantage to be derived from the use of words with many meanings, and it becomes an essential and recognized element in such reasoning. Hegel, who is a master of dialectic, not only lapses into many equivocal meanings, but purposely uses them, and boasts of the advantage to be derived from his native tongue by reason of the many meanings which its words present. His first great work, The Phenomenology of Mind, is esteemed by him and by his followers as the effort by which the foundation of his philosophy was laid. When this work is read paragraph by paragraph and the meanings of words are compared throughout the entire book, it will be found that the argument depends on the equivocal use of words. One can imagine the delight with which he hailed the discovery that he could make an attractive argument and a chain of seemingly invincible reasoning in this manner. His followers have claimed for him some profound secret, but with this key to the Hegelian riddle it is easily read.

METAPHYSIC

Metaphysic is a system of explaining how the essentials of bodies are generated one from another.

Pythagoras taught that unity as number is the primordial essential from which others are derived, the conception being in the spirit of tribal cosmology in which all things are generated or begotten by parents.

Plato considered extension as form to be the primordial property. He exalted mind perhaps more than any philosopher before his time, and with transcendent literary skill sounded its praises. But as he considered form to be the property from which it was derived, he translated mind into terms of form and thus succeeded in imposing upon all coming time the word form as the term signifying notion or concept. Thus idea, which primarily signified form, is now a term of mind.

Aristotle seems to have considered force as the primal property from which all other properties are derived, for thus I interpret his doctrine of energy. Certain it is that since his time there have been metaphysicians who have held this doctrine. Perhaps this error has more widely prevailed than any doctrine of the genesis of the essentials. Aristotle's theory of mind is vague, and his reader may easily defend the proposition that he derives energy from mind, rather than mind from energy.

Spencer resolves extension into force, and impliedly, though not overtly, resolves duration into force in his discussion of the doctrine of evolution; and finally he resolves mind into force; so that Spencer is the modern champion of this theory. Of course Spencer does not consider the derivation to be parental genesis, but genesis by evolution. The American philosopher of this school Mr Lester F. Ward, also derives mind from force by evolution.

Still other philosophers have taught that persistence is the primal property from which all others are derived. This philosophy has been taught as a reification of being, and is known as *ontology*. The term "being" signifies existence, but it is also used in Aryan languages as the common asserter. This double use has always been found in ontology. The prevalent philosophy of medieval time was ontology. Being is not held to be the father of properties, but rather the substrate.

Idealism is the doctrine that the other properties are produced by mind, the foundation of which is consciousness. It began with Berkeley and has been elaborately formulated in the German of Kant, Fichte, Schelling, and Hegel. Mind is reified, and the physical world has its genesis in the human mind, or, as some think, in the mind of God who endowed the human mind with faculties to think his thoughts as he thought them in creation. The physical world is thus an illusion called phenomenon, the reality being noumenon or thought. Two schools of idealists are found; one speaks of noumenon as mind, the other as will. In one school mind is the only substance, in the other will is the only substance.

The essentials with their relations, quantities, properties,

and qualities have severally given rise to a system of metaphysic. As we have called them they are the system of Pythagoras, the system of Plato, the system of Aristotle, the medieval system, and the system of Berkeley. The last system, when will is substituted for mind, may be called the system of Schopenhauer, as a variety of the Berkeleyan system, which also has many other varieties.

We are now prepared for a definition of metaphysic: Metaphysic is the doctrine that one of the essentials of a particle or body is primordial, or the one from which the others are derived. They may be derived by parental genesis, as in ancient metaphysic; by evolution, as in modern materialism; or by creation, as in idealism.

The Pythagorean and the Platonic systems have perished from the earth. The idealists claim that Plato was the founder of their system, and that Aristotle was also a believer in it. Thus they interpret these two Grecian metaphysicians, as I think, erroneously. The medieval system is waning, though it may have some disciples; but apparently they have become idealists. There yet remain to us the Aristotelian and the Berkeleyan. The Aristotelian has been revived by Spencer, greatly expanded and placed upon a clearer foundation; Spencer has many illustrious disciples. Idealism in some one of its many forms prevails widely among metaphysicians. Enlisted among its disciples are many scholarly men who take a leading part in the metaphysic of the schools. They have usually not occupied themselves with the physical sciences, but there are some illustrious exceptions. The Aristotelian system, especially as revived by Spencer, is usually called *materialism*. Materialism and idealism are now rivals in the metaphysical world.

Materialism is a theory of the existence of the world as constituted of forces. This theory is perhaps best expounded by Boscovich as points of motion, not points in motion; centers of motion, not centers in motion. There are no atoms or molecules in motion, but there are atoms and molecules of motion; there are no stars in motion, but stars of motion; there are no waters or gases in motion, but there are gases of motion; there are

no rocks in motion, but there are rocks of motion: there are no plants in motion, but there are plants of motion; there are no animals in motion, but there are animals of motion; there are no thoughts that are the motions of brain particles, as there are no brain particles, for thoughts are motions themselves.

Oftentimes idealism is a theory that all the material objects of the universe, other than human beings, are created or generated by mind, and that human beings are the real things and all other things are but the concepts of human beings. There are no stars, but only human concepts of stars; there are no waters, but only human concepts of waters; there are no rocks, but only human concepts of rocks; there are no plants, but only human concepts of plants; there are no lower animals, but only human concepts of lower animals. God and human beings are realities which manifest themselves to one another in perception and conception as ideas in the objective world

Sometimes it teaches that science is a method of expressing ideas; it is but a system of language and has no other significance than that of a system of language. There is no objective concrete world with which science deals; but there are ideas with which science deals, and the whole function of science is to reduce these ideas to their simplest expression. There is no objective standard of truth; there is only a subjective standard of opinion, and all scientific research is the attempt to formulate these opinions or ideas or concepts or perceptions in universal terms. Science is only a device of language; mathematics is only a device of equations; chemistry is only a device of atoms; astronomy is only a device of worlds; geology is only a device of formations; botany is only a device of cells; biology is only a device of organs. All of these devices are useful for linguistic purposes; they do not express objective reality, but only subjective ideas. The world is a realm of ideas and words; it is not a realm of objective real things!

Idealism accuses all scientific men of being materialists, and it divides mankind into two groups—the good and the evil. The good are idealists and the evil are materialists. The idealists are from heaven and the materialists are from hell.

Idealism accuses materialism of ignoring all values in the world; it forever seeks to belittle scientific research. Chemistry is only a controversy about words; astronomy is only a disputation about words; physics is only a disputation about words; geology is only a disputation about words; botany is only a disputation about words; and zoology is only a disputation about words!

Materialism accuses idealism as being the enemy of science, of rejecting every scientific discovery until it can be translated into terms of idealism, being the great bulwark of ignorance and the fortress of superstition. As idealism is interpreted by materialism, the accusations are true, and as materialism is interpreted by idealism, the accusations are true. Materialism is arrayed against religion, and idealism is arrayed against science.

Idealism is a theory that there is no objective reality, or, to use the language of modern idealism, there is no trans-subjective reality. Symbols are signs of ideas, but not signs of objects. The objective world thus becomes the creation of thought. The apparent or phenomenal objective world is created magically by thought. There are no stars as objective realities; there are only stars by the magic of thought. Astronomy is not a science of orbs which depends on the existence of objective realities; but it is a science of words which depends on our concepts, and contributions to astronomy are only contributions to language and consist only in a better method of using symbols as words to describe our concepts. There are no atoms or molecules or substances as science teaches; but there are concepts of atoms, molecules, and substances, and all contributions to chemistry are but contributions to language by which symbols that do not represent reality, but only concepts, are made more useful as linguistic devices. There is no such thing as motion; motion is but the product of thought. We think there is motion, but it has no objective reality, and contributions to dynamics are only contributions to language!

During the last decade Ladd has published a volume, titled What is Reality?, in which he sets forth in a masterly manner the concomitancy of the categories. In this great work he

treats of the fundamental elements in the fallacies of materialism and idealism, and the metaphysicians of both schools must reckon with him before again stating their systems.

The stream of thought is a succession of judgments, and judgments are made of essentials; hence we cognize by essentials. Judgments are made instantaneously; hence our judgments are infinite, as that term is used in mathematics; they are so multitudinous that we can not enumerate them in statable quantities. Judgments are repeated again and again and thus become habitual, when the objects of judgment are again presented or represented. These abstract judgments are concreted or integrated; for when a judgment is made of one essential, the others are implicated, posited, or presupposed; thus judgments become vicarious. If I judge that a body is one I implicate that it has extension, speed, persistence, and consciousness.

No particle or body can exist without all of its essentials, for they are concomitant. This fact is a refutation not only of materialism and idealism, but of all metaphysical systems.[a]

In metaphysic qualities are not discriminated from other categories. The same number is few or many from an ideal or an adopted standpoint of consideration. The sands of the lake are many compared with the sands of the pond, but the sands of the lake are few when compared with the sands of the sea. The stars of the Milky Way are many compared with the stars of Orion, but the stars of the Milky Way are few compared with all the stars of the firmament. So forms are large or small from artificial standpoints. Structures are simple or complex in the same manner. Forces are strong or weak with different purposes in view; times are long for the same reason, and causes are trivial or potent. Judgments are wise or unwise when the view comes, and the wisdom of yesterday is the folly of to-day. Men have distinguished but slowly between qualities and other categories, and there has always been a tendency to explain unknown categories as qualities, for often they have been dwelt upon before their corresponding categories were known. In the ordinary course

[a] For the demonstration of the concomitancy of essentials, see my volume Truth and Error.

of human reason the first incentive to an investigation of the other categories is derived from a knowledge of their qualities, and so long as they are unknown they are believed to be only qualities.

It is this characteristic of qualities that seems to give warrant to idealism. Qualities always change with the change in view, and they are ideal when we consider things with relation to purposes. You can always discover that idealists consider only qualities among the categories and confuse all others with them. Even while I am writing this statement there comes to hand a new work on idealism, titled The World and the Individual, by Royce. On every page of this book he considers qualities and only qualities. On page 209 he says:

> Those other objects of common human interest are viewed, by common sense, namely, not as Independent Beings, which would retain their reality unaltered even if nobody ever were able to think of them, but rather as objects, such that, while people can and often do think of them, their own sole Being consists in their character as rendering such thoughts about themselves objectively valid for everybody concerned. Their whole *esse* then consists in their value as giving warrant and validity to the thoughts that refer to them. They are external to any particular ideas, yet they can not be defined independently of all ideas.
>
> Do you ask me to name such objects of ordinary conversation? I answer at once by asking whether the credit of a commercial house, the debts that a man owes, the present price of a given stock in the stock market, yes, the market price current of any given commodity; or, again, whether the rank of a given official, the social status of any member of the community, the marks received by a student at any examination; or, to pass to another field, whether this or that commercial partnership, or international treaty, or still once more, whether the British constitution—whether, I say, any or all of the objects thus named, will not be regarded, in ordinary conversation, as in some sense real beings, facts possessed of a genuinely ontological character? One surely says: The debt exists; the credit is a fact; the constitution has objective Being. Yet none of these facts, prices, credits, debts, ranks, standings, marks, partnerships, constitutions, are viewed as real independently of any and of all possible ideas that shall refer to them. The objects now under our notice have, moreover, like physical things, very various grades of supposed endurance and of recognized significance. Some vanish hourly. Others may outlast centuries. The

prices vary from day to day; the credits may not survive the next panic; the constitution may very slowly evolve for ages. None of these objects, moreover, can be called mere ideas inside of any man's head. None of them are arbitrary creations of definition. The individual may find them as stubborn facts as are material objects. The prices in the stock market may behave like irresistible physical forces. And yet none of these objects would continue to exist, as they are now supposed to exist, unless somebody frequently thought of them, recognized them, and agreed with his fellows about them. Their fashion of supposed being is thus ordinarily conceived as at once ideal and extraideal. They are not "things in themselves," and they are not mere facts of private consciousness. You have to count upon them as objective. But if ideas vanished from the world, they would vanish also. They, then, are the objects of the relatively external meanings of ideas. Yet they are not wholly separable from internal meanings.

Well, all of these facts are examples of beings of which it seems easiest to say that they are real mainly in so far as they serve to give truth or validity to a certain group of assertions about each one of them.

Yes, if ideas were to vanish from the world, qualities would vanish also.

What, then, are qualities; and can we define them? Qualities are attributes to good and evil. This definition is perfect, for it is inclusive of all and exclusive of others. All that has been written in this series of articles is designed to set forth their nature. Qualities naturally fall into five groups: There are esthetic qualities, or qualities of pleasure and pain; there are industrial qualities, or qualities of welfare and illfare; there are institutional qualities, or qualities of morality and immorality; there are linguistic qualities, or qualities of truth and falsehood; there are sophiological qualities, or qualities of wisdom and folly.

Those attributes which we call qualities are always found in antithetic pairs. All human activities are performed for purposes, and these purposes are either good or evil; no purposes can be neutral. Hence we see that purposes play a rôle of transcendent importance *in human affairs*. Notwithstanding this, there are other categories of reality in the universe, but personal interest in qualities masks them from the consideration of the metaphysician.

If there has been one cause for the longevity of myths more

potent than another, it has been the doctrine of phenomenon and noumenon as it is held in metaphysic. How often have men erred in judgment when brought to the test of action! What multitudes of judgments have been proved to be erroneous by the test of experience through verification! When men contemplate the mistakes made in every hour of waking life; when men contemplate the hosts of erroneous notions that they have entertained, when they realize that the result of thought is mainly the reconstruction of notions, it is not strange that men should despair of all certitude and cry, "We know not reality, but only appearance!"

Aristotle formulated the laws of disputation as laws of thought itself, and so the logic of scholasticism is but the logic of controversy. When men compared theories of the universe, they found that any theory could be maintained with plausibility because they yet remained ignorant of the laws of verification; it was not strange that a sense of illusion seemed to pervade the universe. Thus the metaphysical doctrine of phenomenon and noumenon is seemingly confirmed.

SCIENCE

It would be a pleasing task to outline the history of science. Science is as old as error. Although human fallacies began with primordial man, knowledge also began with primordial man, and the two have grown together. Science has more and more prevailed, and error has more and more succumbed to its power. As the errors of animism, mythology, cosmology, and metaphysic have been overthrown, there are many who still entertain them, and scientific men have come to call all of these errors folklore, and folklore itself has come to be the subject-matter of science.

The study of folklore is a study of superstitions. Superstitions are opinions which stand over from a lower into a higher state of culture.

There are people who can move their ears at will. The lower animals can do this, but only a few human beings can wink their ears. Organs that are useful in lower species may remain in an imperfect and practically useless state in a more

highly developed species. They are then called vestigial organs. As there are vestigial organs, so there are vestigial opinions. These vestigial opinions are commonly called superstitions. When we come to investigate vestigial opinions and treat them as objects of science, we no longer call them superstitions, but we call them folklore.

The science of folklore may be defined as the science of superstitions, or the science of vestigial opinions no longer held as valid. Yet such erroneous opinions that hold over from the days of greater ignorance to the era of modern scientific research are found to be of profound interest in the revelations which they make of the nature of superstitions themselves. We might neglect them, or seek to substitute for them valid opinions. However, science does not hesitate to investigate any question, and even the natural history of superstitions has come to be a profoundly interesting and instructive science.

Some years ago a movement was made in Europe and America to investigate superstitions themselves on the theory that they are valid. Societies were organized in London, Paris, Berlin, and Boston for the purpose of determining whether or not there is substantial truth in error itself. This is the function of the Societies for Psychical Research, the purpose of which is to discover the truth of dreams, the validity of necromancy, and the reality of ghosts. I have a suspicion that the Societies for Psychical Research are rather instrumental in increasing superstitions than in dispelling them, and that we reap the natural fruit of these researches in the increased prevalence of such abnormal cults and arts as christian science, mind-healing, spirit-rapping, and slate-juggling. Be this as it may, there is one result growing out of the modern Societies for Psychical Research which I hail with pleasure: In the transactions of these societies there is put on record a great body of superstitions, all of which are valuable material as folklore.

Remember it is the science of superstitions, and the science must deal with the fundamental errors of mankind (how the phenomena of nature have been interpreted by savage and barbaric peoples), and how these errors as vestigial phenomena

have remained over in civilization and are still entertained. Of course the ignorant entertain them by wholesale; but it is not the ignorant alone who entertain superstitions. Superstitions are domiciled in many parlors, they are paraded on many platforms, they are worshipped in many temples, and they lurk even in scientific halls and appear in scientific publications and are taught by scientific men. There is much folklore in this world, and sometimes it may be found in strange company.

It is thus that the study of folklore reveals the origin and nature of superstitions and makes the grand scientific distinction between valid concepts and uncanny visions.

The habit of believing in the impossible, of expecting the absurd, and of attributing phenomena to the occult, gives rise to two classes of magical agencies which, from savagery to the highest stages of culture, have played important rôles in the explanation of magic. These are the beliefs in mascots and tabus.

Those who dwell on the mysteries of life, especially as they are revealed in ecstacy, hypnotism, intoxication, and insanity, are forever looking for mascots or mysterious causes. Such occult agencies are sweet morsels to superstitious people, just as scientific men delight in the discovery of scientific facts. What a wonder it was to scientific men to discover that bones could be photographed through their covering of flesh! The discovery of the Röntgen rays was held to be so important that the discoverer was awarded a great meed of praise. But the potency of the left hindfoot of a graveyard rabbit plucked in the dark of the moon is held by superstitious people to be of more importance than the Röntgen rays. More people believe in mascots than believe in telephones, and those who believe in mascots believe that telephones are magical. In the same manner tabus perform wonderful magic feats in the notions of many persons. In savagery there are many tabus, and men must not do this thing nor that thing lest their enterprise should fail. Survival of tabus still exists; for example, thirteen persons must not sit at the table lest one should die. So mascots and tabus still have their influence in civilized society.

Instruction

Having set forth the nature of the opinions held by mankind in different stages of culture, and the way in which science supplants superstition through the agency of verification, it yet remains for us to characterize the agencies by which opinions are propagated. This gives rise to the fifth great system of arts, the last in the pentalogic series, the arts of *sophiology*. A brief characterization will be sufficient for our purposes.

Sophiology is the art of instruction.

NURTURE

It is found that in organized society man has developed five distinct agencies for instruction. In infancy parents instruct their children. As children advance in age, other members of the family take part in the work; and still as the child advances in years his associations are enlarged and all of those persons who constitute his social environment take part. Instruction of this character is well recognized under the term *nurture*.

ORATORY

In tribal society an important agency of instruction is found in oratory. Every patriarch of a clan, every chief of a tribe, every shaman of a brotherhood, every chief of a confederacy, must be an instructor of his people. This instruction is necessarily conveyed by oratory; hence in tribal society a comparatively large number of persons are spokesmen or official orators. In the frequent assemblages of the people by clans, tribes, phratries, and confederacies abundant opportunity occurs for the exercise of this office, and when important matters are up for consideration in the council every man has a right to a voice, and his influence in the tribe depends largely on his powers of persuasion as an orator. Oratory is therefore very highly developed in tribal society. At the dawn of ancient civilization the Greek philosophers employed this method of conveying instruction. In national society there is still opportunity for oratory in the more highly developed council of state.

There are other occasions for oratory. There still remains a field for the employment of oratory in religion, for the religious teacher must be an orator, and one day in the week is set apart for religious instruction. The method of instruction by this means has a long history, and through it mankind have received a large share of their instruction, although in modern times it has been employed chiefly in teaching morals.

EDUCATION

In modern society a distinct agency is organized for the instruction of youth in addition to those included under the terms nurture and oratory. This new instruction is *education.*

In the highest civilization the years of adolescence, and sometimes of early manhood, are consecrated to education, so that much of the time of individual life is occupied in this manner. A multiplicity of schools are organized, a host of teachers are employed, buildings and apparatus are used, so that the cost of education is rapidly advancing *pari passu* with the growing appreciation of its importance. The theory and art of education are undergoing rapid development. We may contemplate with surprise the development of manufacturing interests; we may gaze with wonder at the development of the agencies of transportation; we may consider with profound interest the development of commerce and the modern agencies upon which its highest stages depend, but the wonder of wonders is the development of modern agencies of education. As human muscle is supplanted by electricity, the tallow dips by the incandescent light, the coin by credit, so the text-book is supplanted by the library, the teacher's rod by the instructor's illumination, and the memorized word by the informing idea.

PUBLICATION

In early times many manuscripts were written and important ones were often copied, but altogether this method of multiplication was infrequent. A new civilization began with the events and discoveries that came upon the world about the time of the discovery of America; in this epoch the art of

printing was invented, through which was developed a new system of instruction which has already become universal in civilized society and whose potency for progress can hardly be underestimated. This new system is publication. Books and periodicals constitute the fourth great agency of instruction.

RESEARCH

Research is the potent agency for the development of new opinions. Aristotle is credited with organizing research. Intermittent and feeble research extended from his time on until the epoch of modern civilization. The discovery of America signalizes the beginning of this epoch. Prior to this time research was dangerous; the propogation of new truth was held to be impiety to the gods, old opinions were held to be sacred, and terrible punisment was the reward of him who taught new truths to the world. Prior to this time even the discoveries in astronomy were held by men only in secret, and the flat earth with a revolving sun was the sacred opinion. When the New World was discovered it was so brilliant an example of the results of the belief in a scientific doctrine that science itself was exalted and the scientific man could hold up his head and walk the earth the peer of all men. Since that time research has been organized in many fields and hosts of men have become votaries to research, and now the fifth great sociologic agent is firmly established among the institutions of civilization.

We thus have Nurture, Oratory, Education, Publication, and Research as the five grand arts of Instruction.

LIST OF PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY

Annual Reports

First annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1879–'80 by J. W. Powell director [Vignette] Washington Government Printing Office 1881

Roy. 8°. xxxv, 603 p., 347 fig. (incl. 54 pl.), map. *Out of print.*

Report of the Director. P. xi–xxxiii.

On the evolution of language, as exhibited in the specialization of the grammatic processes, the differentiation of the parts of speech, and the integration of the sentence; from a study of Indian languages, by J. W. Powell. P. 1–16.

Sketch of the mythology of the North American Indians, by J. W. Powell. P. 17–56.

Wyandot government: a short study of tribal society, by J. W. Powell. P. 57–69.

On limitations to the use of some anthropologic data, by J. W. Powell. P. 71–86.

A further contribution to the study of the mortuary customs of the North American Indians, by Dr. H. C. Yarrow, act. asst. surg., U. S. A. P. 87–203, fig. 1–47.

Studies in Central American picture-writing, by Edward S. Holden, professor of mathematics, U. S. Naval Observatory. P. 205–245, fig. 48–60.

Cessions of land by Indian tribes to the United States: illustrated by those in the state of Indiana, by C. C. Royce. P. 247–262, map.

Sign language among North American Indians, compared with that among other peoples and deaf-mutes, by Garrick Mallery. P. 263–552, fig. 61–342*a*, 342*b*–346.

Catalogue of linguistic manuscripts in the library of the Bureau of Ethnology, by James C. Pilling. P. 553–577.

Illustration of the method of recording Indian languages. From the manuscripts of Messrs. J. O. Dorsey, A. S. Gatschet, and S. R. Riggs. P. 579–589.

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Second annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1880–'81 by J. W. Powell director [Vignette] Washington Government Printing Office 1883 [1884]

Roy. 8°. xxxvii, 477 p., 77 pl., fig. 1–35, 347–714 (382 of these forming 98 pl.), 2 maps. *Out of print.*

Report of the Director. P. xv–xxxvii.

Zuñi fetiches, by Frank Hamilton Cushing. P. 3–45, pl. i–xi, fig. 1–3.

Myths of the Iroquois, by Erminnie A. Smith. P. 47–116, pl. xii–xv.

Animal carvings from mounds of the Mississippi valley, by Henry W. Henshaw. P. 117–166, fig. 4–35.

Navajo silversmiths, by Dr. Washington Matthews, U. S. A. P. 167–178, pl. XVI–XX.

Art in shell of the ancient Americans, by William H. Holmes. P. 179–305, pl. XXI–LXXVII.

Illustrated catalogue of the collections obtained from the Indians of New Mexico and Arizona in 1879, by James Stevenson. P. 307–422, fig. 347–697, map.

Illustrated catalogue of the collections obtained from the Indians of New Mexico in 1880, by James Stevenson. P. 423–465, fig. 698–714, map.

Index. P. 467–477.

Third annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1881–'82 by J. W. Powell director [Vignette] Washington Government Printing Office 1884 [1885]

Roy. 8°. LXXIV, 606 p., 44 pl., 200 (+ 2 unnumbered) fig. *Out of print.*

Report of the Director. P. XIII–LXXIV.

On activital similarities. P. LXV–LXXIV.

Notes on certain Maya and Mexican manuscripts, by Prof. Cyrus Thomas. P. 3–65, pl. I–IV, fig. 1–10.

On masks, labrets, and certain aboriginal customs, with an inquiry into the bearing of their geographical distribution, by William Healey Dall, assistant U. S. Coast Survey; honorary curator U. S. National Museum. P. 67–202, pl. V–XXIX.

Omaha sociology, by Rev. J. Owen Dorsey. P. 205–370, pl. XXX–XXXIII, fig. 12–42.

Navajo weavers, by Dr. Washington Matthews, U. S. A. P. 371–391, pl. XXXIV–XXXVIII, fig. 42–59.

Prehistoric textile fabrics of the United States, derived from impressions on pottery, by William H. Holmes. P. 393–425, pl. XXXIX, fig. 60–115.

Illustrated catalogue of a portion of the collections made by the Bureau of Ethnology during the field season of 1881, by William H. Holmes. P. 427–510, fig. 116–200.

Illustrated catalogue of the collections obtained from the pueblos of Zuñi, New Mexico, and Wolpi, Arizona, in 1881, by James Stevenson. P. 511–594, pl. XL–XLIV.

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Fourth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1882–'83 by J. W. Powell director [Vignette] Washington Government Printing Office 1886 [1887]

Roy. 8°. LXIII, 532 p., 83 pl., 565 fig. *Out of print.*

Report of the Director. P. XXVII–LXIII.

Pictographs of the North American Indians. A preliminary paper, by Garrick Mallery. P. 3–256, pl. I–LXXXIII, fig. 1–111, 111*a*–209.

Pottery of the ancient pueblos, by William H. Holmes. P. 257–360, fig. 210–360.

Ancient pottery of the Mississippi valley, by William H. Holmes. P. 361–436, fig. 361–463.

Origin and development of form and ornament in ceramic art, by William H. Holmes. P. 437–465, fig. 464–489.

A study of Pueblo pottery as illustrative of Zuñi culture growth, by Frank Hamilton Cushing. P. 467–521, fig. 490–564.

Index to accompanying papers. P. 523A–532.

Fifth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1883–'84 by J. W. Powell director [Vignette] Washington Government Printing Office 1887 [1888]

Roy. 8°. LIII, 564 p., 23 pl. (incl. 2 pocket maps), 77 fig. *Out of print.*

Report of the Director. P. XVII–LIII.

Burial mounds of the northern sections of the United States, by Prof. Cyrus Thomas. P. 3–119, pl. I–VI, fig. 1–49.

The Cherokee Nation of Indians: a narrative of their official relations with the colonial and federal governments, by Charles C. Royce. P. 121–378, pl. VII–IX (pl. VIII and IX are pocket maps).

The mountain chant: a Navajo ceremony, by Dr. Washington Matthews, U. S. A. P. 379–467, pl. X–XVIII, fig. 50–59.

The Seminole Indians of Florida, by Clay MacCauley. P. 469–531, pl. XIX, fig. 60–77.

The religious life of the Zuñi child, by Mrs. Tilly E. Stevenson. P. 533–555, pl. XX–XXIII.

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Sixth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1884–'85 by J. W. Powell director [Vignette] Washington Government Printing Office 1888 [1889]

Roy 8°. LVIII, 675 p. (incl. 6 p. of music), 10 pl. (incl. 2 pocket maps), 546 fig., 44 small unnumbered cuts. *Out of print.*

Report of the Director. P. XXIII–LVIII.

Ancient art of the province of Chiriqui, Colombia, by William H. Holmes. P. 3–187, pl. I, fig. 1–285.

A study of the textile art in its relation to the development of form and ornament, by William H. Holmes. P. 189–252, fig. 286–358.

Aids to the study of the Maya codices, by Prof. Cyrus Thomas. P. 253–371, fig. 359–388.

Osage traditions, by Rev. J. Owen Dorsey. P. 373–397, fig. 389.

The central Eskimo, by Dr. Franz Boas. P. 399–669, pl. II–X, fig. 390–546 (pl. II and III are pocket maps).

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Seventh annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1885–'86 by J. W. Powell director [Vignette] Washington Government Printing Office 1891 [1892]

Roy. 8°. XLIII, 409 p., 27 pl. (incl. pocket map), 39 fig. *Out of print.*

Report of the Director. P. XV–XLI.

Indian linguistic families of America north of Mexico, by J. W. Powell. P. 1–142, pl. I (pocket map).

The Midē'wiwin or "grand medicine society" of the Ojibwa, by W. J. Hoffman. P. 143–300, pl. II–XXIII, fig. 1–39.

The sacred formulas of the Cherokees, by James Mooney. P. 301–397, pl. XXIV–XXVII.

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Eighth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1886–'87 by J. W. Powell director [Vignette] Washington Government Printing Office 1891 [1893]
Roy. 8°. XXXVI, 298 p., 123 pl., 118 fig. *Out of print.*

Report of the Director. P. XIII–XXXVI.
A study of Pueblo architecture: Tusayan and Cibola, by Victor Mindeleff. P. 3–228, pl. I–CXI, fig. 1–114.
Ceremonial of Hasjelti Dailjis and mythical sand painting of the Navajo Indians, by James Stevenson. P. 229–285, pl. CXII–CXXIII, fig. 115–118.
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Ninth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1887–'88 by J. W. Powell director [Vignette] Washington Government Printing Office 1892 [1893]
Roy. 8°. XLVI, 617 p., 8 pl., 448 fig. *Out of print.*

Report of the Director. P. XIX–XLVI.
Ethnological results of the Point Barrow expedition, by John Murdock, naturalist and observer, International polar expedition to Point Barrow, Alaska, 1881–1883. P. 3–441, pl. I–II, fig. 1–428.
The medicine-men of the Apache, by John G. Bourke, captain, third cavalry, U. S. army. P. 443–603, pl. III–VIII, fig. 429–448.
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Tenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1888–'89 by J. W. Powell director [Vignette] Washington Government Printing Office 1893 [1894]
Roy. 8°. XXX, 822 p., 54 pl., 1291 fig., 116 small unnumbered cuts. *Out of print.*

Report of the Director. P. III–XXX.
Picture-writing of the American Indians, by Garrick Mallery. P. 3–807, pl. I–LIV, fig. 1–145, 145*a*–1290.
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Eleventh annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1889–'90 by J. W. Powell director [Vignette] Washington Government Printing Office 1894
Roy. 8°. XLVII, 553 p., 50 pl., 200 fig. *Out of print.*

Report of the Director. P. XXI–XLVII.
The Sia, by Matilda Coxe Stevenson. P. 3–157, pl. I–XXXV, fig. 1–20.
Ethnology of the Ungava district, Hudson Bay territory, by Lucien M. Turner. [Edited by John Murdoch.] P. 159–350, pl. XXXVI–XLIII, fig. 21–155.
A study of Siouan cults, by James Owen Dorsey. P. 351–544, pl. XLIV–L, fig. 156–200.
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Twelfth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1890–'91 by J. W. Powell director [Vignette] Washington Government Printing Office 1894
Roy. 8°. XLVIII, 742 p., 42 pl., 344 fig. *Out of print.*

Report of the Director. P. XIX–XLVIII.
Report on the mound explorations of the Bureau of Ethnology, by Cyrus Thomas. P. 3–730, pl. I–XLII, fig. 1–344.
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Thirteenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1891–'92 by J. W. Powell director [Vignette] Washington Government Printing Office 1896

Roy. 8°. LIX, 462 p., 60 pl., 330 fig. *Out of print.*

Report of the Director. P. XIX–LIX.
Prehistoric textile art of eastern United States, by William Henry Holmes. P. 3–46, pl. I–IX, fig. 1–28.
Stone art, by Gerard Fowke. P. 47–178, fig. 29–278.
Aboriginal remains in Verde valley, Arizona, by Cosmos Mindeleff. P. 179–261, pl. X–L, fig. 279–305.
Omaha dwellings, furniture, and implements, by James Owen Dorsey. P. 263–288, fig. 306–327.
Casa Grande ruin, by Cosmos Mindeleff. P. 289–319, pl. LI–LX, fig. 328–330.
Outlines of Zuñi creation myths, by Frank Hamilton Cushing. P. 321–447.
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Fourteenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1892–93 by J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1896 [1897]

Roy. 8°. Two parts, LXI, 1–637; 639–1136 p., 122 pl., 104 fig. *Out of print.*

Report of the Director. P. XXV–LXI.
The Menomini Indians, by Walter James Hoffman, M. D. P. 3–328, pl. I–XXXVII, fig. 1–55.
The Coronado expedition, 1540–1542, by George Parker Winship. P. 329–613, pl. XXXVIII–LXXXIV.
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The Ghost-dance religion and the Sioux outbreak of 1890, by James Mooney. P. 641–1110, pl. LXXXV–CXXII, fig. 56–104.
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Fifteenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1893–'94 by J. W. Powell director [Vignette] Washington Government Printing Office 1897

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The Siouan Indians: a preliminary sketch, by W J McGee. P. 153–204.
Siouan sociology: a posthumous paper, by James Owen Dorsey. P. 205–244, fig. 30–38.
Tusayan katcinas, by Jesse Walter Fewkes. P. 245–313, pl. CIV–CXI, fig. 39–48.
The repair of Casa Grande ruin, Arizona, in 1891, by Cosmos Mindeleff. P. 315–349, pl. CXII–CXXV.
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Sixteenth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1894–'95 by J. W. Powell director [Vignette] Washington Government Printing Office 1897

Roy. 8°. CXIX, 326 p., 81 pl., 83 fig. *Out of print.*

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Tusayan snake ceremonies, by Jesse Walter Fewkes. P. 267–312, pl. LXX–LXXXI.

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Seventeeth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1895–96 by J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1898 [part 1, 1900, part 2, 1901]

Roy. 8°. Two parts, XCV, 1–128, 129*–344*, 129–468; 465–752 p., 182 pl., 357 fig. *Out of print.*

Report of the Director. P. XXV–XCIII.

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Comparative lexicology, by J. N. B. Hewitt. P. 299*–344*.

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Eighteenth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1896–97 by J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1899 [part 1, 1901, part 2, 1902]

Roy. 8°. Two parts, LVII, 1–518; 519–997 p., 174 pl., 165 fig. *Out of print.*

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Nineteenth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1897–98 by J. W. Powell

director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1900 [1902]

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Twentieth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1898–99 by J. W. Powell director [Vignette] Washington Government Printing Office 1903

Roy. 8°. 180 pl., 79 fig.

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Twenty-first annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1899–1900 by J. W. Powell director [Vignette] Washington Government Printing Office 1903

Roy. 8°. 69 pl. *In press.*

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Hopi katcinas, drawn by native artists, by Jesse Walter Fewkes. P. 3–126, pl. II–LXIII.

Iroquois cosmogony, by J. N. B. Hewitt. P. 127– —, pl. LXIV–LXIX.

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Twenty-second annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1900–01 by W J McGee acting director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1903

Roy. 8°. Two parts. 91 pl., 178 fig. *In press.*

Report of the Acting Director.
Two summers' work in pueblo ruins, by Jesse Walter Fewkes. Pl. I–LXX, fig. 1–120.
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The Hako, a Pawnee ceremony, by Alice C. Fletcher, holder of Thaw fellowship, Peabody Museum, Harvard University. Pl. LXXXIII–XCI, fig. 169–178.
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Twenty-third annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1901–02 by W J McGee acting director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1904

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(1). Bibliography of the Eskimo language by James Constantine Pilling 1887

8°. v. 116 p. (incl. 8 p. of facsimiles).

(2). Perforated stones from California by Henry W. Henshaw 1887

8°. 34 p., 16 fig.

(3). The use of gold and other metals among the ancient inhabitants of Chiriqui, Isthmus of Darien by William H. Holmes 1887

8°. 27 p., 22 fig.

(4). Work in mound exploration of the Bureau of Ethnology by Cyrus Thomas 1887

8°. 15 p., 1 fig.

(5). Bibliography of the Siouan languages by James Constantine Pilling 1887

8°. v, 87 p.

(6). Bibliography of the Iroquoian languages by James C. Pilling 1888 [1889]

8°. VI, 208 p. (incl. 4 p. facsimiles), 5 unnumbered facsimiles. *Out of print.*

(7). Textile fabrics of ancient Peru by William H. Holmes 1889
8°. 17 p., 11 fig.

(8). The problem of the Ohio mounds by Cyrus Thomas 1889
8°. 54 p., 8 fig.

(9). Bibliography of the Muskhogean languages by James Constantine Pilling 1889
8°. v, 114 p. *Out of print.*

(10). The circular, square, and octagonal earthworks of Ohio by Cyrus Thomas 1889
8°. 35 p., 11 pl., 5 fig. *Out of print.*

(11). Omaha and Ponka letters by James Owen Dorsey 1891
8°. 127 p.

(12). Catalogue of prehistoric works east of the Rocky mountains by Cyrus Thomas 1891
8°. 246 p., 17 pl. and maps.

(13). Bibliography of the Algonquian languages by James Constantine Pilling 1891 [1892]
8°. x, 614 p., 82 facsimiles. *Out of print.*

(14). Bibliography of the Athapascan languages by James Constantine Pilling 1892
8°. xiii, 125 p. (incl. 4 p. facsimiles).

(15). Bibliography of the Chinookan languages (including the Chinook jargon) by James Constantine Pilling 1893
8°. xiii, 81 p. (incl. 3 p. facsimiles).

(16). Bibliography of the Salishan languages by James Constantine Pilling 1893
8°. xiii, 86 p. (incl. 4 p. facsimiles).

(17). The Pamunkey Indians of Virginia by Jno. Garland Pollard 1894
8°. 19 p.

(18). The Maya year by Cyrus Thomas 1894
8°. 64 p., 1 pl.

(19). Bibliography of the Wakashan languages by James Constantine Pilling 1894
8°. xi, 70 p. (incl. 2 p. facsimiles).

(20). Chinook texts by Franz Boas 1894 [1895]
8°. 278 p., 1 pl.

(21). An ancient quarry in Indian Territory by William Henry Holmes 1894
8°. 19 p., 12 pl., 7 fig.

(22). The Siouan tribes of the East by James Mooney 1894 [1895]
8°. 101 p., map.

(23). Archeologic investigations in James and Potomac valleys by Gerard Fowke 1894 [1895]
8°. 80 p., 17 fig.

(24). List of the publications of the Bureau of Ethnology with index to authors and subjects by Frederick Webb Hodge 1894
8°, 25 p.

25. Natick dictionary by James Hammond Trumbull 1903
Roy. 8°. XXVIII, 349 p.

26. Kathlamet texts by Franz Boas 1901
Roy. 8°, 261 p., 1 pl.

27. Tsimshian texts by Franz Boas 1902
Roy. 8°. 244 p.

28. Haida texts by John R. Swanton *In preparation.*

29. Mexican and Central American antiquities and calendar systems Nine papers by Eduard Seler translated from the German under the supervision of Charles P. Bowditch *In preparation.*

30. Mayan antiquities, calendar systems, and history Twenty papers by E. Förstemann, Paul Schellhas, Carl Sapper, Eduard Seler, and E. P. Dieseldorff translated from the German under the supervision of Charles P. Bowditch *In preparation.*

31. Kwakiutl texts by Franz Boas *In preparation.*

Contributions to North American Ethnology

(All of the volumes of this series are out of print)

Department of the Interior U. S. Geographical and Geological Survey of the Rocky Mountain Region J. W. Powell in charge—Contributions to North American ethnology—Volume I [–VII, IX]—[Seal of the department] Washington Government Printing Office 1877 [–1893]
4°. 9 vols.

Contents

Volume I, 1877:

Part I. Tribes of the extreme Northwest, by W. H. Dall. P. 1–106, 10 unnumbered pl., 9 unnumbered fig., pocket map.

On the distribution and nomenclature of the native tribes of Alaska and the adjacent territory. P. 7–40, pocket map.

On succession in the shell-heaps of the Aleutian islands. P. 41–91, 10 pl., 9 fig.

On the origin of the Innuit. P. 93–106.

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Notes on the natives of Alaska (communicated to the late George Gibbs, M. D., in 1862), by His Excellency J. Furuhelm, late governor of the Russian-American colonies. P. 111–116.

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Part II. Tribes of western Washington and northwestern Oregon, by George Gibbs, M. D. P. 157–241, pocket map.

Appendix to part II. Linguistics. P. 243–361.

Vocabularies [by George Gibbs, Wm. F. Tolmic, and G. Mengarini]. P. 247–283.

Dictionary of the Niskwalli [Nisqualli-English and English-Nisqualli], by George Gibbs. P. 285–361.

VOLUME II, 1890 [1891]:

The Klamath Indians of southwestern Oregon, by Albert Samuel Gatschet. Two parts, cvii, 711 p., map; iii, 711 p.

VOLUME III, 1877:

Tribes of California, by Stephen Powers. 635 p., frontispiece, 44 fig. (incl. 42 pl.), 3 p. music, pocket map.

Appendix. Linguistics, edited by J. W. Powell. P. 439–613.

VOLUME IV, 1881:

Houses and house-life of the American aborigines, by Lewis H. Morgan. xiv, 281 p., frontispiece, 57 fig. (incl. 28 pl.).

VOLUME V, 1882:

Observations on cup-shaped and other lapidarian sculptures in the Old World and in America, by Charles Rau. 1881. 112 p., 61 fig. (forming 35 pls.).

On prehistoric trephining and cranial amulets, by Robert Fletcher, M. R. C. S. Eng., act. asst. surgeon U. S. Army. 1882. 32 p., 9 pl., 2 fig.

A study of the manuscript Troano, by Cyrus Thomas Ph. D., with an introduction by D. G. Brinton, M. D. 1882. xxxvii, 237 p., 9 pl., 101 fig., 25 small unnumbered cuts.

VOLUME VI, 1890 [1892]:

The Cegiha language, by James Owen Dorsey. xviii, 794 p.

VOLUME VII, 1890 [1892]:

A Dakota-English dictionary, by Stephen Return Riggs, edited by James Owen Dorsey. x, 665 p.

VOLUME VIII:

[NOTE. As was announced in the list of publications issued as Bulletin 24, it was the intention to publish Professor Holmes' memoir on the pottery of the eastern United States as Volume VIII of the Contributions, but as the act of January 12, 1895, failed to provide for the completion of this series, the eighth volume will not be published.]

VOLUME IX, 1893 [1894]:

Dakota grammar, texts, and ethnography, by Stephen Return Riggs, edited by James Owen Dorsey. xxxii, 239 p.

Introductions

(All of the volumes of this series are out of print)

(1). Introduction to the study of Indian languages, with words, phrases, and sentences to be collected. By J. W. Powell. [Seal of the Department of the Interior.] Washington: Government Printing Office. 1877.

4°. 104 p., 10 blank leaves.

Second edition as follows:

(2). Smithsonian Institution—Bureau of Ethnology J. W. Powell director—Introduction to the study of Indian languages with words, phrases and sentences to be collected—by J. W. Powell—Second edition—with charts—Washington Government Printing Office 1880

4°. xi, 228 p., 10 blank leaves, 4 kinship charts in pocket. A 16° "Alphabet" of 2 leaves accompanies the work.

(3). Smithsonian Institution—Bureau of Ethnology—Introduction to the study of sign language among the North American Indians as illustrating the gesture speech of mankind—by Garrick Mallery brevet lieut. col., U. S. army—Washington Government Printing Office 1880

4°. iv, 72 p., 33 unnumbered figs.

(4). Smithsonian Institution—Bureau of Ethnology J. W. Powell, director—Introduction to the study of mortuary customs among the North American Indians—by Dr. H. C. Yarrow act. asst. surg. U. S. A.—Washington Government Printing Office 1880

4°. ix, 114 p.

Miscellaneous Publications

(All of the works in this series are out of print)

(1). Smithsonian Institution—Bureau of Ethnology J. W. Powell, director—A collection of gesture-signs and signals of the North American Indians with some comparisons by Garrick Mallery brevet lieut. col. and formerly acting chief signal officer, U. S. army—Distributed only to collaborators—Washington Government Printing Office 1880

4°. 329 p.

Note. 250 copies printed for use of collaborators only.

(2). Smithsonian Institution—Bureau of Ethnology J. W. Powell director—Proof-sheets of a bibliography of the languages of the North American Indians by James Constantine Pilling—(Distributed only to collaborators)—Washington Government Printing Office 1885

4°. xl, 1135 p., 29 pl. (facsimiles).

NOTE. Only 110 copies printed for the use of collaborators, 10 of them on one side of the sheet.

It was the intention to have this Bibliography form Volume X of the Contributions to North American Ethnology, but the work assumed such proportions that it was subsequently deemed advisable to publish it as a part of the series of Bulletins, devoting a Bulletin to each linguistic stock.

(3). Linguistic families of the Indian tribes north of Mexico, with provisional list of the principal tribal names and synonyms. [1885] 16°. 55 p.

NOTE. A few copies printed for the use of the compilers of a Dictionary of American Indians now in preparation. It is without title-page, name, or date, but was compiled from a manuscript list of Indian tribes by James Mooney.

(4). [Map of] Linguistic stocks of American Indians north of Mexico by J. W. Powell. [1891.]

NOTE. A limited edition of this map, which forms plate 1 of the Seventh Annual Report, was issued on heavy paper, 19 by 22 inches, for the use of students. This map was revised and published in the Report on Indians Taxed and Not Taxed in the United States at the Eleventh Census, 1890.

(5). Tribes of North America, with synonymy. Skittagetan family. [1890] 4°. 13 p.

NOTE. A few copies printed for the use of the compilers of the Dictionary of American Indians. It was prepared by H. W. Henshaw, and contains two samples of style for the Dictionary, the second beginning on page 7 with the head, "Dictionary of Indian tribal names."

(6). Advance pages Smithsonian Institution Bureau of American Ethnology—Dictionary of American Indians north of Mexico . . . [Vignette] Washington 1903 8°. 33 p.

NOTE. Prepared by F. W. Hodge. Two hundred and fifty copies printed by the Smithsonian Institution for the use of the compilers of the Dictionary.

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JULIUS BIEN & CO. LITH. N.Y.

INDIAN WOMAN OF FLORIDA, WITH EARTHEN BOWL AND EARS OF CORN(?).
FROM A DRAWING BY JOHN WHITE, NOW IN THE BRITISH MUSEUM.

ABORIGINAL POTTERY OF THE EASTERN UNITED STATES

BY

W. H. HOLMES

20 ETH—03——1

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ABORIGINAL POTTERY OF THE EASTERN UNITED STATES

By W. H. Holmes

PREFACE

During the decade beginning with 1880 the writer published a number of detailed studies of the aboriginal pottery of the United States. These were based largely on the Government collections, and appeared mainly in the annual reports of the Bureau of Ethnology. The ware of several localities was described and illustrated in a catalog of Bureau collections for 1881, published in the Third Annual Report, and the same volume contained a paper on "Prehistoric Textile Fabrics Derived from Impressions on Pottery." The Fourth Annual Report contained illustrated papers on "Ancient Pottery of the Mississippi Valley" and "Form and Ornament in the Ceramic Art." In 1885 a paper on the collections of the Davenport Academy of Sciences appeared in the fourth volume of the Academy's proceedings, and several short articles have since appeared in the American Anthropologist. It was expected by the Director of the Bureau that the studies thus made, being preliminary in character, would lead up to a monographic treatise on native fictile art to form one of a series of works covering the whole range of native arts and industries.

The present paper was commenced in 1890, and in its inception was intended to accompany and form part of the final report of Dr Cyrus Thomas on mound explorations conducted for the Bureau during the period beginning with 1881 and ending in 1891. A change in the original plan of publication dissociated the writer's work from that of Dr Thomas, whose report was assigned to the Twelfth Annual, which it occupies in full. Delay in publishing the present paper afforded an opportunity for additional exploration and study, and the work was revised and amplified. Its scope was extended from the consideration of the pottery of the mound builders to that of the entire region east of the Rocky mountains, the volume of matter being more than doubled and the value of the work greatly enhanced.

The collections made use of in the preparation of this paper are very extensive, and represent a multitude of village sites, mounds, graves, cemeteries, shell heaps, and refuse deposits in nearly all sections of the great region under consideration. At the same time it should be noted that the material available is far from complete or satisfactory. Much of it was carelessly collected and insufficiently labeled, and some districts are represented by mere random sherds which can not be depended on as a basis for important deductions. The collections made by the Bureau of American Ethnology are the most important, and some recent explorations have added material of a high order scientifically. Of the latter the work of Mr Frank H. Cushing in Florida and of Clarence B. Moore in Florida and other southern states may be specially mentioned.

Details not considered essential to the story of the art have been omitted. Tedious recitals of form, color, size, and use of individual specimens have been avoided, the illustrations being relied on as the most satisfactory means of conveying a full and correct impression of the art. It was intended by the Director of the Bureau, when the preparation of preliminary papers on the various aboriginal arts began, that the illustrations prepared as the work developed should be brought together in final form in the monographic volumes of Contributions to North American Ethnology. It was found, however, that to utilize all of the material thus made available would in this case make the volume excessive, so a careful selection has been made from the earlier illustrations, and typical examples have been brought together in plates. In the main, however, the illustrations here presented are new, as the old work did not extend much beyond the one ceramic group represented in the Middle Mississippi Valley province.

The writer is much indebted to officers and custodians of the following institutions and societies for privileges accorded and assistance given in the preparation of this work: The National Museum, Washington; the Davenport Academy of Sciences, Iowa; the Peabody Museum, Cambridge; the American Museum of Natural History, New York; the Academy of Sciences, Philadelphia; the Free Museum of Science and Art, Philadelphia; the Museum of Art, Cincinnati; and the Canadian Institute, Toronto.

To many individual collectors grateful acknowledgments are due. Chief among them are the following: Mr W. H. Phillips, of Washington, whose cooperation and assistance have been of the greatest service and whose collection of archeologic materials from the Potomac valley is unequaled; Mr Thomas Dowling, jr., whose collections from the same region have always been at the writer's disposal; Colonel C. C. Jones, of Augusta, Georgia, to whom the country and especially the southern states are indebted for so much of value in the departments of history and archeology; General Gates P. Thruston, of

Nashville, whose explorations in Tennessee have yielded an unrivaled collection of valuable relics and whose writings have been freely drawn on in the preparation of this work; Mr W. K. Moorehead, of Xenia, Ohio, whose various collections have been made available for study; Mr Clarence B. Moore, of Philadelphia, whose great collections from the mounds and shell heaps of Florida, Georgia, and Alabama the writer has been called on to describe; Mr Frank Hamilton Cushing, whose technologic skill has been of frequent assistance and whose collections from the central New York region and from Florida have been of much service; Reverend W. M. Beauchamp, of Baldwinsville, New York, who has furnished data respecting the ceramic work of the Iroquois; Mr H. P. Hamilton, of Three Rivers, Wisconsin, a careful collector of the fragile relics of the west shore of Lake Michigan, and Mr E. A. Barber, who kindly supplied a large body of data relating to the tobacco pipes of the region studied.

Mention may also be made of the writer's great indebtedness to those who have assisted him in various ways as collaborators; to Mr W J McGee, whose scientific knowledge and literary skill have been drawn on freely on many occasions; to Mr William Dinwiddie, whose excellent photographs make it possible to present a number of unrivaled illustrations; to Mr John L. Ridgway, Miss Mary M. Mitchell, and Mr H. C. Hunter for many excellent drawings; to Mr DeLancey Gill for his very efficient management of the work of drawing, engraving, and printing illustrations, and to many other members of the Smithsonian Institution, the Bureau of American Ethnology, the Geological Survey, and the National Museum for valued assistance.

INTRODUCTION

Ceramic Art in Human History

Objects of art may be studied with immediate reference to two main lines of investigation. First, they may be made to assist in telling the story of the origin and evolution of art and thus of many branches of culture, and, finally, of man; and second, they may be made to bear on the history of particular groups of people, of communities, tribes, and nations, and through these again on the origin and history of the race, the ultimate object of the whole group of investigations being a fuller comprehension of what man is, what he has been, and what he may hope to be.

The ceramic art takes an important place among the arts of man, and its products, and especially its prehistoric remains, are invaluable to the student of history. Of the lower stages of progress through which all advanced nations have passed—stages represented still by some of the more primitive living peoples—this art can tell us little, since it was late taking its place in the circle of human attainments, but it records much of the history of man's struggles upward through the upper savage and barbarian stages of progress. It preserves, especially, the story of its own growth from the first crude effort of the primitive potter to the highest achievement of modern culture. It also throws many side lights on the various branches of art and industry with which it has been associated.

Of all the movable products of barbarian art it appears that pottery is the most generally useful in locating vanished peoples and in defining their geographic limitations and migrations. The reasons for this may be briefly stated as follows: first, the need of vessels is common to all mankind, and the use of clay in vessel making is almost universal among peoples sufficiently advanced to utilize it; second, since the clay used readily receives the impress of individual thought, and, through this, of national thought, the stamp of each people is distinctly impressed upon its ceramic products; third, the baked clay is almost indestructible, while, at the same time, it is so fragile that fragments remain in plenty on every site occupied by the pottery makers; fourth, vessels are less than all other articles fitted for and subject to transportation, being the most sedentary, so to speak, of all minor artifacts. It follows that, so far as objects of art are capable of so doing, they serve, as has been said, to mark their maker's habitat and indicate his movements.

Still more fully pottery records the history of the decorative arts—the beginnings and progress of esthetic evolution. To a large extent, also, religious conceptions are embodied in it. Mythical beings are modeled and painted, and their strange symbols are introduced into the decorations. Every touch of the potter's hand, of the modeling tool, the stylus, and the brush becomes, through changes wrought in the plastic clay by the application of heat, an ineffaceable record of man's thought and of woman's toil. These fictile products, broken and scattered broadcast over all habitable lands, are gathered and hoarded by the archeologist, and their adventitious records are deciphered with a fullness and clearness second only to that attained in the reading of written records.

Notwithstanding the above-mentioned very decided advantages of the ceramic art over other arts as a record of prehistoric peoples, its shortcomings in this direction are apparent at a glance. The student is embarrassed by the parallelisms that necessarily exist between the arts of widely separated peoples of like grade of culture and like environment. Even the discriminating investigator may be misled in his efforts to use these relics in the tracing of peoples. Other classes of confusing agencies are interchanges by trade, multiple occupation of sites, adoption of pottery-making captives, and the amalgamation of communities; by all of these means works of distinct families of people may in cases be thrown into such close association as to make ethnic determinations difficult and uncertain.

The danger of making erroneous use of prehistoric works of art in the identification of peoples is especially great where the number of available relics is limited, as is very often the case in archeologic collections. Conclusions of importance respecting a given people may in this way be based on evidence afforded by intrusive products or on exceptional conditions or phenomena—conclusions difficult to controvert and increasingly difficult to correct as the years pass by.

Aboriginal American Pottery

It is hardly possible to find within the whole range of products of human handicraft a more attractive field of investigation than that offered by aboriginal American ceramics, and probably no one that affords such excellent opportunities for the study of early stages in the evolution of art and especially of the esthetic in art. The early ware of Mediterranean countries has a wider interest in many ways, but it does not cover the same ground. It represents mainly the stages of culture rising above the level of the wheel, of pictorial art, and of writing, while American pottery is entirely below this level, and thus illustrates the substratum out of which the higher phases spring. But it should be noted that not merely the beginnings of the story are represented in the native work. The culture range covered

is quite wide, and opportunities of tracing progress upward to the very verge of civilization are afforded. Between the groups of products belonging to the inferior tribes scattered over the continent from Point Barrow to Terra del Fuego, and those representing the advanced cultures of Central America and Peru, there is a long vista of progress. Near the upper limit of achievement is the pottery of Mexico, comprising a wonderful cluster of well-marked groups. Some of the highest examples of the ceramic art are found in or near the valley of Mexico, and a number of striking vases of this region, preserved in the Mexican National Museum, may be regarded as masterpieces of American fictile art. Central and South America furnish a series of superb groups of earthenware, among which are those of Guatemala, Nicaragua, Costa Rica, Chiriqui, Colombia, Bolivia, Peru, Brazil, and Argentina, each disputing with Mexico the palm of merit. Following these in order are various groups of ware whose remains are assembled about the margins of the greater culture centers or distributed widely over remoter districts. The work of the Pueblo tribes in Arizona and New Mexico, all things considered, stands first within the area of the United States; closely approaching this, however, is the attractive ware of the Mississippi valley and the Gulf coast. Below this and at the base of the series is the simple pottery of the hunter tribes of the North.

Numerous tribes have continued to practice the art down to the present time, some employing their original methods and producing results but little modified by the lapse of centuries, while others, coming more directly under the influence of the whites, have modified their work so that it no longer has any particular value to the ethnologist devoted to aboriginal studies. The Pueblo country furnishes the best example of survival of old methods and old ideals. Here numerous tribes are found practicing the art successfully, producing vases and other articles quite equal in many respects to the ancient product. The study of the present practices is highly instructive, and the archeologist may begin his study of the ancient pottery of America with a pretty definite knowledge of the technical and functional status of the art, as well as a clear conception of the manner in which it embodies the symbolic and esthetic notions of a people.

Pottery of the Eastern United States

GEOGRAPHIC GROUPING

In the eastern United States the study of the potter's art is essentially an archeologic study, although something may be learned by a visit to the Catawba and Cherokee tribes of North and South Carolina, and accounts published by those who have witnessed the practice of

the art in past generations, although meager enough, are not appealed to in vain, as will be amply shown in subsequent sections of this paper.

The first requisite on taking up the study of a field so extensive and varied is a means of classifying the phenomena. We soon observe that the pottery of one section differs from that of another in material, form, color, and decoration, and that groups may be defined each probably representing a limited group of peoples, but more conveniently treated as the product of a more or less well-marked specialization area. By the aid of this grouping it is easy to proceed with the examination of the ware, and a reasonably clear idea of the art of the regions and of the whole field may readily be gained.

First in importance among the groups of ware is that called in former papers the Middle Mississippi Valley group. Geographically this group presents some interesting features, which will be considered in detail later. The margins of the area it occupies are not well defined, and occasionally pieces of the ware are found far outside its ordinary habitat and associated with strangers. This area has a central position in the Mississippi valley, and other varieties of pottery lie to the north, east, and south, with overlapping and often indefinite outlines. On the north is the area characterized by ware to which I have for convenience given the name Upper Mississippi or Northwestern group. In the Ohio valley we have varieties of ware to which local names may be attached. The New York or Iroquoian pottery occupies the states of New York and Pennsylvania, extending in places into other states and into Canada. We have Atlantic Algonquian ware, South Appalachian ware, and several groups of Gulf Coast ware. Many of these groups are so clearly differentiated as to make their separate study easy. Within the limits, however, of their areas are numerous subgroups which do not possess such strong individuality and such clear geographic definition as the larger ones, but which may well be studied separately and may in time be found to have an ethnic importance quite equal to that of the better-defined groups of ware. Although they are confined to such definite geographic areas we are not at all sure, as has been pointed out, that these groups of ware will be found to have any intelligible correspondence with the stocks of people that have at one time or another occupied the region, for varieties of art phenomena are often regional rather than ethnic. Besides, many important groups of people have not left great accumulations of art products, and great groups of products may have been left by comparatively insignificant communities. Separate groups of people may have practiced nearly identical arts, and portions of a single people may have practiced very different arts. In view of these and other uncertainties hampering the correlation of archeologic data with peoples, we can not do better than at first

study the ancient ware by itself, and afterward proceed in such special case as may offer encouragement in that direction to connect the art with the peoples, adding such evidence as may be thus secured to our knowledge of the history of families and tribes.

Up to the present time there has been a very imperfect understanding of the character and scope of the fictile products of the whole region east of the Rocky mountains. Some writers have regarded everything indiscriminately as simple, rude, and of little importance; others, going to the opposite extreme, have found marked variations with impassible gulfs between the higher and lower forms—gulfs corresponding to the wide distinctions supposed by some early writers to exist between the cultures of the so-called mound-builder and the common Indian.

Notwithstanding the fact that the ware of eastern North America is easily separable into groups, some of which differ widely from others, when we assume a broader point of view all varieties are seen to be members of one great family, the points of correspondence being so marked and numerous that the differences by means of which we distinguish the groups sink into comparative insignificance. A wide range of accomplishment is apparent, and strong evidences of individuality are discovered in the different groups, but these differences are probably far in excess of the differences existing in the culture status of the peoples concerned in their production. This fact is apparent when we observe the relative condition of progress among the tribes of to-day. It is seen that the arts are not symmetrically and equally developed; the inferior ware of one locality does not indicate that the people of that locality were inferior in culture, for the reverse may be the case, but it may signify that the conditions of life were such that the potter's art was uncalled for, or imperfectly practiced, while other arts took the lead and were highly perfected. The culture status of a given people must be determined by a consideration of the sum of the planes of all the arts and not by the plane of any one art.

It has often been remarked that the pottery of the North is rude as compared with that of the South, but in Florida and on the Gulf coast pottery is now and then found which is quite as low in the scale as anything about the borders of the Great lakes, and occasional specimens from New York, Ohio, Michigan, and Wisconsin fairly rival in all essential features the best products of the southern states. Conditions governing the practice of the art were, however, on the whole, decidedly more favorable in the South, and here it has been practiced more fully and more constantly than in the North.

Climatic conditions, degree of sedentation, nature of food supply, and availability of material have each a marked influence on the condition of the arts. The art that flourishes on the Gulf coast with a

prosperous sedentary people may be undeveloped or entirely neglected by a people wandering from place to place in the barren, icy regions of the North; yet, could we for a generation exchange the environments of these peoples, the potter's art would still be found practiced and flourishing in the more salubrious climate and neglected and disused in the rigorous one.

QUANTATIVE DISTRIBUTION

Earthenware relics are very generally distributed over the country, but the distribution is far from uniform. Wherever pottery-making tribes dwelt, wherever they wandered, camped, sought water, collected food, conducted ceremonies, or buried their dead, there we find the relics of this art. Usually, no doubt, localities and regions occupied by prosperous sedentary peoples are marked by greater accumulations of such remains. The native tribes, no matter whence they came, distributed themselves along the great waterways, and the more favorable spots along such rivers as the Ohio, the Tennessee, the Mississippi, and the Red river possess almost inexhaustible supplies of ancient ware. A broad region, including the confluences of the great streams of the Mississippi system, the Missouri, the Ohio, the Tennessee, the Cumberland, and the Arkansas, seems to be the richest of all, yet there are less-extended areas in other sections almost equally rich. The observation has been made that an arid environment encourages the vessel-making arts, but here we have a region abounding in moisture which is richer than any other section in its supply of clay vessels.

MANNER OF OCCURRENCE

Since pottery was made very largely for use in the domestic arts, its remains are everywhere associated with household refuse, and are found on all village, house, camp, and food-producing sites occupied by pottery-making peoples. It is plentiful in the great shell heaps and shell mounds along the Atlantic and Gulf coasts, and abounds in and around saline springs where salt was procured. Found under such conditions it is usually fragmentary, and to the superficial observer gives a very imperfect idea of the nature and scope of the art, but to the experienced student it affords a very satisfactory record.

Nearly all peoples have at some period of their history adopted the practice of burying articles of use or value with their dead, and the aborigines of this country were no exception. It is to this mortuary usage that we owe the preservation of so many entire examples of fragile utensils of clay. They are exhumed from burial mounds in great numbers, and to an equal extent, in some regions, from common cemeteries and simple, unmarked graves. The relation of various

articles of pottery to the human remains with which they were associated in burial seems to have been quite varied. It is probable that the position of the vessel was to a certain extent determined by its office; it may have contained food or drink for the dead, personal articles of value, or offerings to deities to be propitiated, and custom or fancy dictated the position it should occupy; but it appears that in many cases the articles were cast in without regard to relative position or order.

CHRONOLOGY

Anthropologists are well agreed that pottery making is not one of the earliest arts practiced by primitive man. Its beginnings probably mark in a general way the step from savagery to the lower stages of barbarism, as defined by Morgan. If the average aborigines of the eastern half of the United States be regarded as occupying, at the time of European colonization, the middle status of barbarism, it would seem that the practice of the art was not new, having probably extended through all of the first stage of barbarism. It is not possible, however, to arrive at any idea of the equivalent of this range of progress in years. From the depth of certain accumulations, from the succession of strata, and from the great mass of the structures in which fictile remains are found in some sections, we are led to believe that many centuries have passed since the discovery or introduction of the art; but that it was still comparatively young in some of the eastern and northern sections of the United States is strongly suggested, first, by the scarcity of sherds, and second, by a comparison of its functional scope with that of the ceramic art of the more advanced nations of Mexico and Central America, among whom it filled a multitude of important offices. With many of our nomadic and semisedentary tribes it had not passed beyond the simplest stage of mere vessel making, the only form employed being a wide-mouthed pot. It may be questioned, however, whether degree of simplicity is a valuable index of age. It is possible that in a region where conditions are unfavorable the art could be practiced a thousand years without material change, while in a more favored environment it might, in the same period and with a people of no greater native ability, rise through a succession of stages to a high degree of perfection.

FUNCTIONAL GROUPING

Classification of Use

The uses to which the earthenware of the aborigines was applied were numerous and important; they may be classed roughly as domestic, industrial, sacerdotal, ornamental, and trivial or diversional. To the first class belong vessels for containing, cooking, boiling (as in sugar and salt making), eating, drinking, etc.; to the second class

belong various implements used in the arts, as trowels and modeling tools; to the third class belong vessels and other articles used in funeral rites, as burial urns and offerings; as personal ornaments there are beads, pendants, and ear and lip plugs; and for trivial and diversional uses there are toy vessels, figurines, and gaming articles. Most of the objects may serve a number of uses, as, for example, a single vessel may, with a simple people, answer for culinary, for religious, and for mortuary purposes, and tobacco pipes may have ceremonial as well as medical and diversional uses.

Although the esthetic idea was considerably developed among all classes of our aborigines, and much attention was paid to embellishment, it is not probable that any vessel was manufactured for purely ornamental purposes. Neither can it be shown that in the area covered by the present study earthenware served, as do our terra cottas, for portraiture or for records of any description.

Pottery was probably first used in connection with the employment of fire in culinary work—in heating water and in cooking food—and there is no doubt that the cooking, the storing, and the transporting of food and drink remained everywhere the most important of its functions.

Differentiation of Use

The differentiation of use, which must have taken place gradually, probably began by the setting aside or the manufacture of certain vessels for special departments of domestic work. Afterward, when vessels came to be used in ceremonies—religious, medical, or mortuary—certain forms were made for or assigned to special rites. The vessel that served in one office was not considered appropriate for another, and one that was sacred to one deity and had decorations symbolizing his attributes was not considered acceptable to another. We do not know to what extent special shapes were made for different sacerdotal uses by our eastern aborigines, but it is safe to say that this class of specialization had made decided headway in the west and south.

Differentiation in the functions of vessels was probably to some extent of preceramic development, since art in clay sprang into existence long after other arts had been well perfected, and pottery naturally fell heir to duties previously performed by vessels of bark, wicker, shell, fruit shells, horn, stone, or other more archaic receptacles for boiling, serving, containing, and transporting.

Vessels for Culinary and Other Domestic Uses

Primitive earthen vessels have usually a round or somewhat conical base, which suggests the manner of their use. Among savage races hard, level floors were the exception, while floors of sand or soft earth were the rule, and under such conditions a round or conical base would be most convenient. The pot in cooking was generally set directly on

the fire, and was kept in position by the fuel or other supports placed about its sides. This is illustrated in plate II, a copy of the original of plate XV of Hariot's New Found Land of Virginia, now pre-

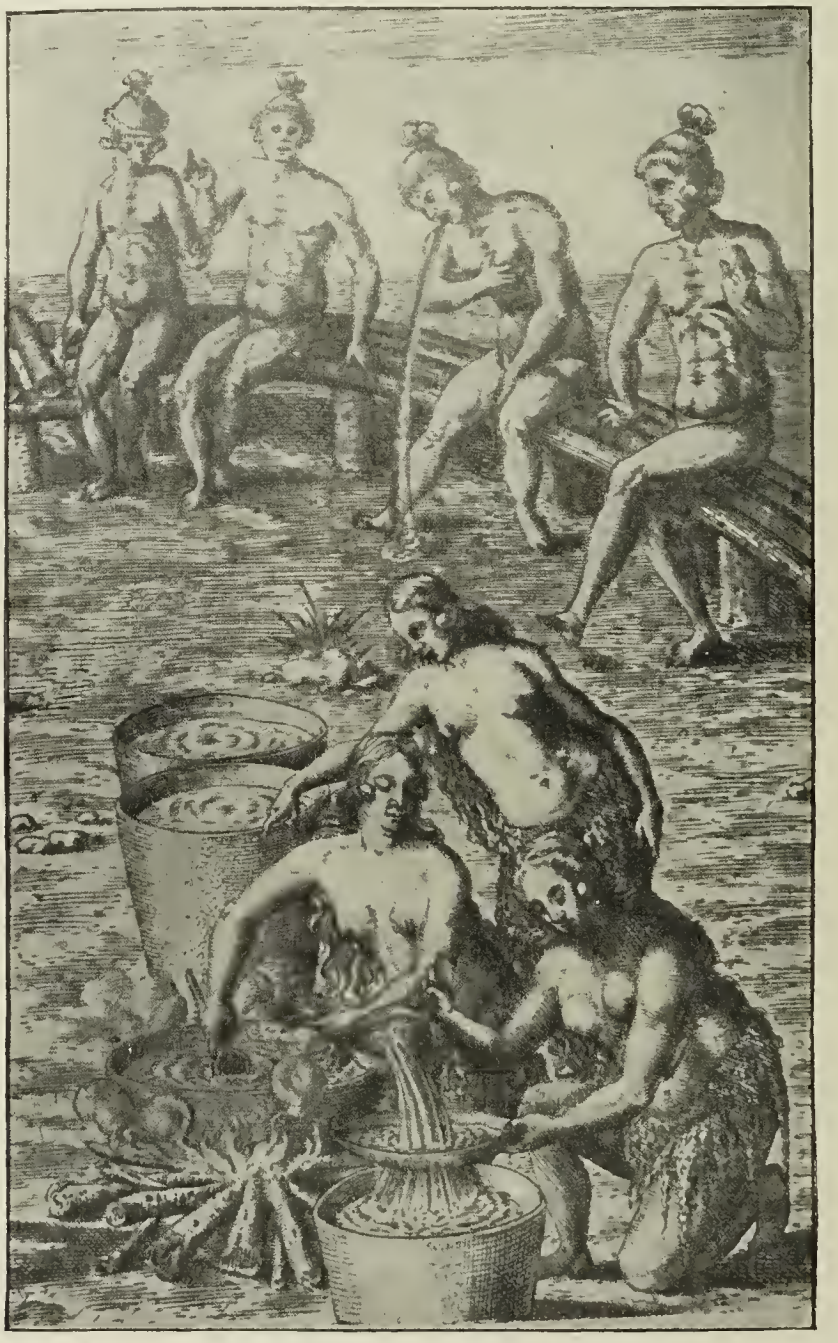


FIG. 1—Indian women using earthen vessels in making cassine. From Lafitau, J. F., Mœurs des sauvages ameriquains, vol. II, plate V, figure 1.

served in the British Museum, London. A curious specimen of early colonial illustration, depicting a number of women preparing a ceremonial drink called cassine in earthen vessels, is reproduced from Lafitau in figure 1. Boiling by means of heated stones cast into the



USE OF THE EARTHEN POT IN BOILING

DRAWN BY JOHN WHITE, OF THE ROANOKE COLONY, 1585-1588

vessel may have been practiced for some time after the introduction of pottery as a survival of the preceramic usage, and was probably resorted to on occasion by many primitive peoples.

In cases, probably, the earthen vessel was suspended over the fire by means of poles, vines, and cords, as shown in figure 2, from Schoolcraft's Indian Tribes. This method of suspension is made possible by the attachment of strong ears or handles, by eccentric modeling of the rim—such as accentuated incurving or outcurving—or by perforation of the upper margin. As a rule, however, the vessels show no indications of this kind of use, and the form is seldom such as to warrant the conclusion that suspension was intended. But a small percent-

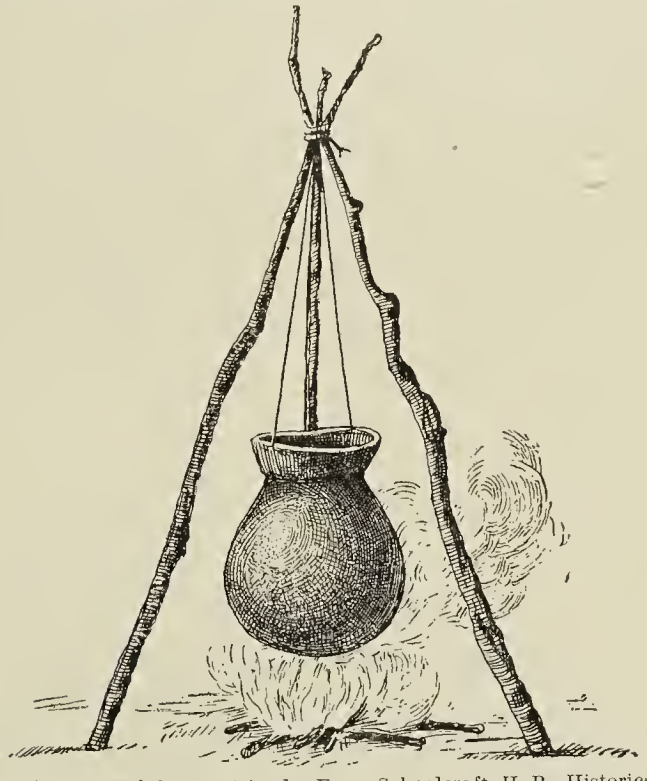


FIG. 2—Suspension of the vessel from a tripod. From Schoolcraft, H. R., Historical and statistical information respecting the . . . Indian tribes of the United States, part 1, plate XXII.

age of prehistoric vessels recovered in the complete state show indications of use over fire. This is accounted for by the fact that entire vessels are mostly obtained from graves and were mortuary rather than culinary utensils. The broken ware obtained from refuse heaps and habitation sites is the débris of cooking, eating, and drinking utensils, and of vessels for carrying and storing, and this very often shows indications of use over fire.

SALT-MAKING VESSELS

The evaporation of saline waters for the purpose of obtaining salt was carried on by the natives in several favorable localities in the Mississippi valley. It is probable that the waters were evaporated by

means of heat applied to the vessel in the usual manner, but it is also held by good authorities that the work was sometimes conducted by means of exposure simply to the rays of the sun.

A somewhat remarkable class of earthenware vessels, the remnants of which are found at several points in the Mississippi valley, is believed to have been employed in the manufacture of salt. The localities are scattered over a large area extending as far east as Knoxville, Tennessee, and as far west as White river in north-central Arkansas and southern Missouri. The distinguishing characteristics of the vessels are their large size, their vat-like shape (see plate III *a*), the great thickness of their walls, and their peculiar surface finish (*b*, *c*), which consists largely of impressions of coarse, open-mesh textile fabrics. They are found in most cases in or near the vicinity of saline springs. Perhaps the best known locality is on Saline river, near Shawneetown, Illinois. It is not improbable that similar springs formerly existed at points now marked by the occurrence of this remarkable ware, where no salines now exist. It is definitely stated by the Knight of Elvas that the Indians of the Mississippi valley manufactured salt. He informs us that—

> The salt is made along by a river, which when the water goes down leaves it upon the sand. As they can not gather the salt without a large mixture of sand, it is thrown together into certain baskets they have for the purpose, made large at the mouth and small at the bottom. These are set in the air on a ridgepole and, water being thrown on, vessels are placed under them wherein it may fall; then, being strained and placed on the fire, it is boiled away, leaving salt at the bottom.[a]

In another place it is stated that—

> They passed through a small town where was a lake and the Indians made salt; the Christians made some on the day they rested there from water that rose nearby from springs in pools.[b]

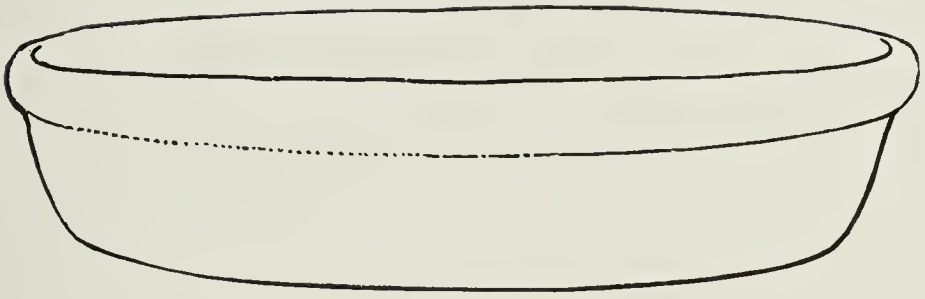
The above locations must both have been in Arkansas and not far from Hot Springs.

Typical specimens of this ware are found in the suburbs of Nashville, Tennessee; at Shawneetown, Illinois; near Vincennes, Knox county, Indiana; in Knox county, Tennessee; in Alexander and Union counties, Illinois; at Kimmswick, near St Louis, Missouri; at Ste Genevieve, Missouri; at one or more points in Ohio; and probably, as is indicated by Schoolcraft, on White river above Batesville, Arkansas. Schoolcraft says that—

> It is common, in digging at these salt mines, to find fragments of antique pottery, and even entire pots of a coarse earthenware, at great depths below the surface. One of these pots which was, until a very recent period, preserved by a gentleman at Shawneetown, was disinterred at the depth of 80 feet, and was of a capacity to contain 8 or 10 gallons. Others have been found at even greater depths, and of greater dimensions. We will not venture to state the surprising capacities of several

[a] Smith, Thomas Buckingham, Narratives of the career of Hernando de Soto, as told by a knight of Elvas, and in a relation by L. Hernandez de Biedma, New York, 1866, p 124.

[b] Same work, p. 153.



a, USUAL FORM OF LARGE SALT VESSELS OR VATS



b, FRAGMENT OF LARGE SALT VESSEL, SHOWING CORD IMPRESSIONS



c, FRAGMENTS OF SALT VESSEL FROM "SULPHUR SPRING," NASHVILLE, TENNESSEE
(THRUSTON COLLECTION, DIAMETER ABOUT 31 INCHES, HEIGHT 12 INCHES)

EARTHEN VESSELS USED IN SALT MAKING

MIDDLE MISSISSIPPI VALLEY GROUP

of these antique vessels that were described to us, lest, not having seen them, there may be some error in the statements, which were, however, made in the fullest confidence. The composition and general appearance of this fossil pottery can not be distingnished from those fragments of earthenware which are disclosed by the mounds of the oldest period, so common in this quarter, and evince the same rude state of the arts. In all this species of pottery which we have examined there is a considerable admixture of silex in the form of pounded quartz, or sand, in comparatively coarse grains; which, as is very well known, has a tendency to lessen the shrinkage of the clay, to prevent cracks and flaws in drying, and to enable the mass to sustain the sudden application of heat without liability to burst. The whole art of making chemical crucibles, as well as those employed in a large way in several manufactures where great heats are necessary, is founded on this principle.[a]

Brackenridge states that—

> The saline below Ste Genevieve, cleared out some time ago and deepened, was found to contain wagonloads of earthenware, some fragments bespeaking vessels as large as a barrel, and proving that the salines had been worked before they were known to the whites.[b]

In 1901 I visited a village site near Kimmswick, Missouri, where salt had been made by the aborigines from local saline springs. The vicinity of the springs was plentifully supplied with the coarse, net-marked sherds, and many pieces were scattered over the neighboring village site. Specimens restored from the fragments, and now preserved in museums in Kimmswick and St Louis, are shallow bowls, from 20 to 30 inches in diameter. Some specimens are quite plain. A good example of this class is illustrated in plate x.

The great depth at which the ware is sometimes found is recorded by Mr George Escoll Sellers, who has had ample opportunity for personal observation of the Illinois salines. The bed rock in one of the saline river springs worked by the whites is 42 feet below the surface, and pottery was found at this depth by the workmen who sunk the well.

Mr Sellers's views are expressed in the following paragraph:

> This, to me, is conclusive evidence that, whoever the people were who left the masses of broken pottery as proof of their having used the salt waters, they resorted to precisely the same means as did their more civilized successors of our time—that is, sinking wells or reservoirs to collect the brine; and the dipper-jug which had been dropped had sunk to the bottom, showing that their reservoirs were down to the rock.[c]

That the aboriginal peoples should have excavated to so great a depth seems almost incredible. Even if there were good reason for such a work native appliances would hardly have been equal to the task of constructing the necessary walls of stone or casing of wood. It is more probable that the spring channels were naturally of dimensions permitting the vessels to sink gradually to these great depths.

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[a] Schoolcraft, H. R., Travels in the central portions of the Mississippi valley, New York, 1825, p. 202.

[b] Brackenridge, H. M., Views of Louisiana, Pittsburg, 1814, p. 186.

[c] Sellers, George Escoll, Aboriginal pottery of the salt springs, Illinois, in Popular Science Monthly, vol. XI, New York, 1877, p. 576.

Mr Sellers discovered a village or camp site in proximity to one of these springs, and his observations with respect to it are as follows:

I found the most abundant remains of pottery, not only represented by fragments of the large, coarse salt pans, but by many pieces of small vessels of much finer texture and of superior workmanship, such as would be used for domestic purposes. From these and large quantities of chippings and offal I inferred that this was the site of the old settlement. The broken pottery, the black soil, the waste from long occupancy extending a considerable distance both east and west of the springs, and to the foot of the bluffs on the south, covering an area of about 30 acres, were confirmatory of this view.[a]

A burial place was found on a terrace at no great distance. Some of the stone cists were paved with fragments of the "great salt pans," but these were much decayed. This, Mr Sellers believes, conclusively couples the tenants of these ancient graves with the makers and the users of the salt pans.

In regard to the manufacture of these remarkable vessels it appears that Mr Sellers's observations and theories are in the main correct. That baskets were not used is apparent on the most casual examination. The manner of using the fabrics with which the ware is marked is discussed in the present paper under the head Manufacture. Mr Sellers's identification of the factory is also well supported, and there is nothing improbable in the theory of the use of clay molds or cores to model on, though there is little corroborative evidence on this point.

A remarkable example of this pottery recently found in the suburbs of Nashville, Tennessee, is now in the collection of General Gates P. Thruston, of Nashville. It is a flat-bottomed basin about 31 inches in diameter and 12 inches deep; the walls are nearly an inch in thickness and the surface has the characteristic fabric impressions (see plate III *c*). A large fragment of this vase is illustrated in his work on the Antiquities of Tennessee, plate X, and the following paragraph relating to it is quoted therefrom:

The large vessel was found within a few yards of the "Sulphur Spring," or the old "French Lick," at Nashville, in excavating for the foundations of the new spring-house. This sulphur and salt spring was doubtless the central feature of a populous aboriginal settlement for centuries. Extensive burial grounds were found on both sides of the "Lick Branch," and many fine implements and specimens of earthenware have been obtained there.[b]

In the discussion of stone graves in the vicinity of Nashville, Tennessee, Mr R. S. Robertson makes the following remarks in regard to fragments of salt vessels:

These graves are found everywhere about Nashville and within the city limits. On the ridges close to the Sulphur Spring the stones inclosing such graves may be seen protruding from the ground, where the earth above has weathered off. Fragments of pottery abound, some of the common sort, and others very thick—about one-half

[a] Sellers, Aboriginal pottery of the salt springs, pp. 576–577.

[b] Thruston, Gates P., The antiquities of Tennessee, Cincinnati, 1890, pp. 157–158.

to three-fourths inch—composed of a grayish clay, with large fragments of shells. The vessels of which they were part must have been very large. Traditionally, they are believed to have been used in evaporating salt from the spring. A brief search resulted in finding numerous specimens on the surface and protruding from the sides of the ridges near the surface. It is said that the saline properties of the spring were more noticeable before the deep bore was made which produced the sulphur water, which is so much patronized.[a]

We have from East Tennessee, in Knox county, specimens of this ware identical with that from Nashville and other more western localities. Although this pottery is not correlated with any particular salt lick or spring, we may fairly assume that it was employed in making salt, since there are salt springs in the vicinity.

Referring to explorations of Mr William McAdams, of Alton, the Alton, Illinois, Telegraph speaks of salt springs on Saline creek, Cooper county, Missouri, in the following words:

> These springs were also a great resort of the aborigines and mound-builders, and the ground about the oozing brine, to the depth of 3 or 4 feet, is filled with the remains of the peculiar earthen vessels used by the mound-builders in salt making. In the woods about, for the whole vicinity is covered with a forest, are many mounds and earthworks. From one small mound two of the earthen salt kettles were obtained. They were shaped like shallow pans, an inch and a half in thickness and near 4 feet across the rim.[b]

Another site noted for the occurrence of this peculiar earthenware is located in St Louis county, Missouri, near the village of Fenton. Here there are springs, both sulphur and salt. This site has been visited by Mr O. W. Collett, of St Louis, who gives an account of it in the Kansas City Review, vol. IV, p. 104.

The following statement made by Du Pratz is sufficiently definite on the question of native salt making:

> About 30 leagues up the Black river on the left side, there is a stream of salt water flowing from the west; about 2 leagues up this stream is a lake of salt water which is nearly 2 leagues in length by 1 in width; 1 league farther up toward the north another lake of salt water is discovered, almost as long and broad as the first.
>
> This water passes without doubt through some salt mines; it has the taste of salt without the bitterness of sea water. The natives come from a long distance to this place to hunt in winter and to make salt. Before the French had traded them kettles they made earthen pots at the place, for this purpose; when they had enough to load themselves, they returned to their country loaded with salt and dried meats.[c]

Sugar-making Vessels

In comparatively recent aboriginal times, if not in very ancient times, earthen pots were used for collecting and boiling the sweet sap of the sugar maple. So far as my observations have gone the earliest mention of sugar making by the aborigines is found in Joutel's Journal, writ-

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[a] Robertson, R. S., Antiquities of Nashville, Tennessee, Smithsonian Report for 1877, Washington, 1878, pp. 277–278.

[b] See also McAdams, Wm., Prehistoric remains from southeast Missouri, Kansas City Review, vol. VII, Kansas City, 1884, p. 279.

[c] Du Pratz, Antoine Simon Le Page, Histoire de la Louisiane, Paris, 1758, vol. I, pp. 307–308.

ten nearly two hundred years ago. Lafitau, whose observations began about the year 1700, gives an illustration in which the whole process is indicated—the tapping of the trees, the collecting of sap, the boiling of the water, and the shaping of the soft sugar into cakes, the latter work being conducted by an Indian woman who in the engraving is represented as a handsome Caucasian girl. It will be seen from the following extract that this author makes the definite statement that the French learned the art from the Indians—no particular nation being mentioned, however. He writes as follows:

In the month of March, when the sun has acquired a little force and the trees commence to contain sap, they make transverse incisions with the hatchet on the

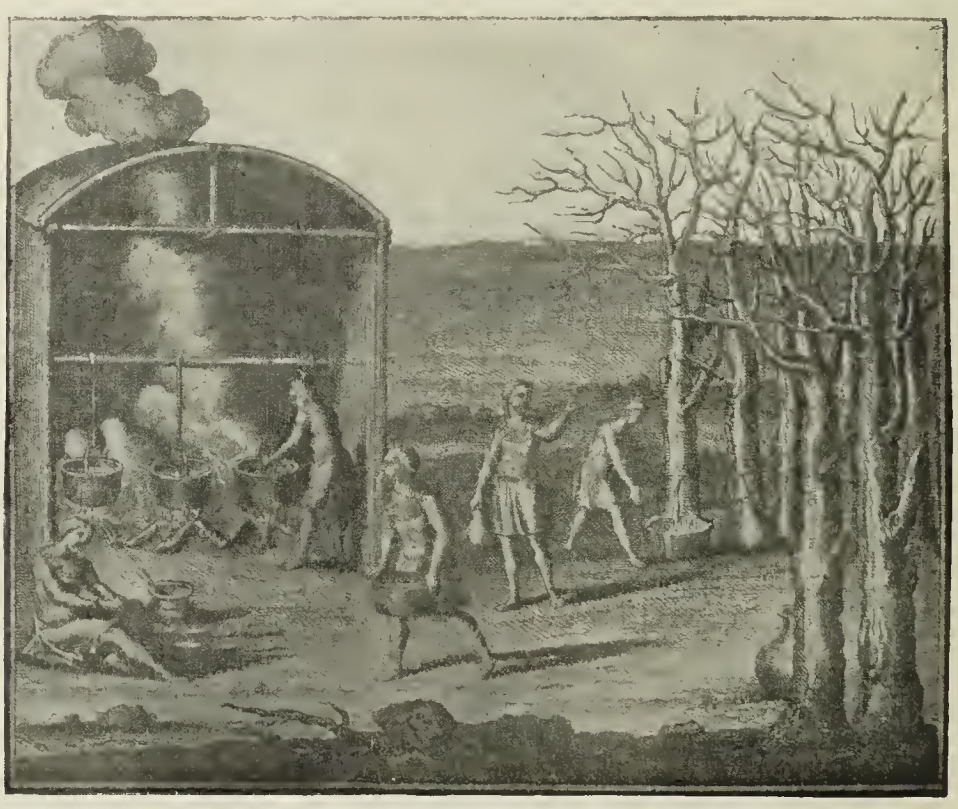


FIG. 3—Native maple-sugar making. Reproduced from Lafitau.

trunks of these trees, from which there flows in abundance a liquid which they receive in large vessels of bark; they then boil this liquid over the fire, which consumes all the phlegm and causes the remainder to thicken to the consistency of sirup or even of a loaf of sugar, according to the degree and amount of heat which they choose to give it. There is no other mystery. This sugar is very pectoral, excellent for medicine; but although it may be more healthy than that of the canes, it has not a pleasing taste nor delicacy and almost always has a little burnt flavor. The French prepare it better than the Indian women from whom they learned to make it; but they have not yet reached the point of bleaching and refining it.[a]

The description of Lafitau's plate may be translated as follows:

The women occupied in watching the vessels, which are already full of the liquid that flows from the trees, carry this liquid and pour it into the kettles seen on

[a] Lafitau, Joseph François, Mœurs des sauvages ameriquains, Paris, 1724, vol. II, p. 154

the fire, which are watched by an old woman, while another, seated, kneads with the hands this thickened liquid, now in a condition to acquire the consistency of sugar loaf.[a]

This plate was reproduced in an article on maple-sugar making by H. W. Henshaw, published in the American Anthropologist for October 1890 and is given in figure 3.

The following extract from Hunter indicates that the making of maple sugar by the Indians was very generally practiced. He is speaking of the Osage Indians and their neighbors.

> In districts of country where the sugar maple abounds the Indians prepare considerable quantities of sugar by simply concentrating the juices of the tree by boiling till it acquires a sufficient consistency to crystallize on cooling. But as they are extravagantly fond of it, very little is preserved beyond the sugar-making season. The men tap the trees, attach spigots to them, make the sap troughs; and sometimes, at this frolicking season, assist the squaws in collecting sap.[b]

Dr Lyman C. Draper makes the following statement, which sufficiently indicates the nature of the sugar-making industry in recent times:

> From twenty-five to thirty years ago, when I resided at Lockport, in western New York, I well remember that large quantities of stirred maple sugar were brought into the country, made by the Indians in the Mackinaw region, and put up in small bark boxes, containing from one to several pounds each.[c]

Sugar is still made by a number of tribes, but earthen vessels have probably not been used in its manufacture for many years.

Spindle Whorls of Clay

The state of culture of the eastern tribes had not yet led to the general employment of many earthenware articles beyond the mere vessel for cooking and containing. The clay effigies so common in some sections were generally vessels shaped exteriorly to resemble animal forms, exceptions being noted especially in Florida, where various mortuary figures having no practical function were manufactured. Spindle whorls appear to have been used to a limited extent in the South, and in Adair's time clay was used for weighting the spindle. Speaking of the use of wild hemp, that author remarks that—

> The old women spin it off the distaffs with wooden machines having some clay on the middle of them to hasten the motion.[d]

As found on ancient sites, however, there is difficulty in distinguishing such articles from beads, gaming disks, or other perforated bits of clay, and I have discovered few examples of fully authenticated spindle whorls within the area here considered.

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[a] Lafitau, Mœurs des sauvages ameriquains, vol. II; Explication des planches et des figures, planche VII.

[b] Hunter, John D., Memoirs of a captivity among the Indians, London, 1823, p. 290.

[c] Draper, Lyman C., in Grignon, Augustin, Recollections; Third Annual Report and Collections of the Wisconsin Historical Society, Madison, 1857, p. 255.

[d] Adair, James, History of the American Indians, London, 1775, p. 422.

Musical Instruments of Earthenware

Many early writers mention the use of earthern vessels for drums. Parchment or buckskin was stretched over the mouths of large pots, and this, beaten with sticks, furnished the music for dances and ceremonies and noise for the gratification of savage taste. In Central America and apparently, also, in Florida special forms were modeled for this purpose, the rim being shaped for the convenient attachment of the skin head.

Joutel, speaking of the southern Indians, states that on burial occasions the—

> dancers take care to tie calabashes or gourds about their bodies, with some Indian wheat in them, to rattle and make a noise, and some of them have a drum, made of a great earthen pot, on which they extend a wild goat's skin, and beat thereon with one stick, like our tabors.[a]



Fig. 4—Use of earthen vessel as a drum (Potherie).

Potherie has bequeathed us an illustration of an Indian beating a pottery drum (see figure 4)—drawn from description, no doubt, but interesting as a record of facts or statements not embodied, so far as has been noted, in the text of his work.[b]

Lafitau mentions the use of earthenware drums by the Iroquois; and Butel-Dumont makes the following statement, reference being had to the Louisiana Indians:

> The next day at dawn all this troop sets out on the march, having at its head the cleverest among them, who carries the calumet, and as they approach the village all begin to sing and dance. One of them carries in the left hand an earthen pot covered with a dressed deerskin stretched tightly over it and fastened to it by a cord, and with a single drumstick in his right hand he beats the time on this pot, which serves

[a] Joutel's Journal of La Salle's last voyage, in French, B. F., Historical collections of Louisiana, pt. 1, New York, 1846, pp. 187–188.

[b] Potherie, Bacqueville de la, Histoire de l'Amérique septentrionale, Paris, 1753, vol. I, plate opp. p. 17.

as a drum; all respond by cries, which they utter in time; some carry *Chichiconas* or empty gourds, in which are placed glass beads or little pebbles to make a noise, and they shake them in time with the rest.[a]

Lawson mentions the use of an earthen porridge pot with deerskin head as a drum by Indians of Carolina. Were it considered necessary, many other references could be made to the use of earthenware drums.

Whistles and rattles of baked clay are very common in Mexico, and in Central and South America; but few examples, so far as the writer has learned, have been discovered in the mound region. General Thruston, in his valuable work on the "Antiquities of Tennessee," illustrates an earthenware rattle and the pellets of clay used in it (see figure 5). A few vases have been found having hollow legs or attached animal features, in which pellets were placed so that when used on festive or ceremonial occasions they would serve as rattles as well as receptacles.

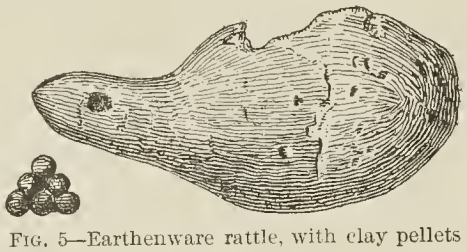
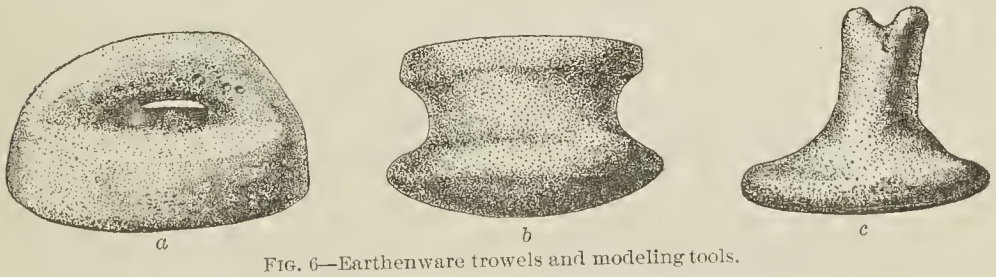


FIG. 5—Earthenware rattle, with clay pellets (Thruston).

VARIOUS IMPLEMENTS OF EARTHENWARE

Trowel-like objects of baked clay are occasionally found in the central districts of the Mississippi valley, and illustrations are given in figure 6*a*, and also in a subsequent section. The body is discoidal in shape, and an arched loop or a ridge springing from one side serves as a handle. The other side, which is the working surface, is slightly convex, never flat, and generally shows considerable polish. These objects resemble in a general way our ordinary smoothing or "flat"



a *b* *c*

FIG. 6—Earthenware trowels and modeling tools.

iron for laundry work. General Thruston found excellent examples of these implements in graves near Nashville, Tennessee, and he is convinced they were trowels used in plastering and smoothing walls and floors of houses. A similar implement having, instead of a loop handle, an upright stem from 1 to 6 inches in length and 1 inch or more in diameter occurs very generally over the middle Mississippi region (see figure 6*b*, *c*). The upper end of the handle is sometimes enlarged a little or simply rounded off, and again it is divided into two

[a] Butel-Dumont, George Marie, Mémoires sur la Louisiane, Paris, 1753, vol. I, pp. 192–3.

or three lobes or prongs. When placed stem downward these implements very closely resemble an ordinary form of toadstool. They have been regarded by some as stoppers for bottles, but this was certainly not their normal use, and General Thruston is probably right in classing them as modeling tools for pottery making. The convex surface is smooth, often retaining the peculiar polish that comes from long use. The form is exactly suited to use in supporting the wall of the semiplastic vase from within while the manipulation of the outer surface is going on with paddles or other modeling or decorating tools (see figure 7). It is true that all forms of these objects may have been used in rubbing surfaces under manipulation or in pulverizing substances in mortars, taking the place of mullers or pestles of wood and stone, and this was the view of Dr Joseph Jones with respect to the loop-handled variety. When a number of these objects of both forms are placed together, with the polished convex surface to the front, all are seen to be identical in appearance, save that a few of the loop-handled variety are oval in outline (see plate XXXVI).

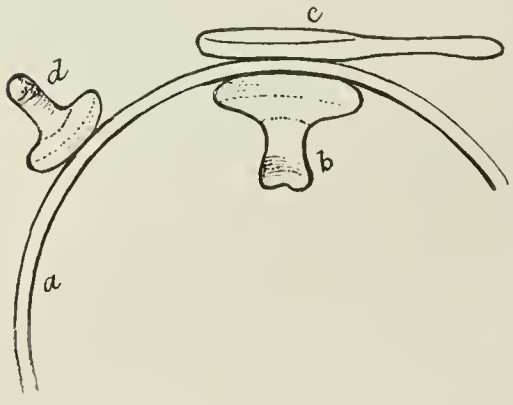


FIG. 7—Probable manner of using earthenware modeling tools: *b* as an interior support, *c* as a modeling or decorating paddle, *d* as a polishing implement.

BAKED-CLAY OFFERING RECEPTACLES

Another not uncommon use of baked clay was in the construction of sacrificial basins or altars. Dr Joseph Jones in the following paragraph describes the use of a large shallow receptacle not differing materially from the salt pans already described:

In the center of the mound, about 3 feet from its surface, I uncovered a large sacrificial vase or altar, 43 inches in diameter, composed of a mixture of clay and river shells. The rim of the vase was 3 inches in height. The entire vessel had been molded in a large wicker basket formed of split canes and the leaves of the cane, the impressions of which were plainly visible upon the outer surface. The circle of the vase appeared to be almost mathematically correct. The surface of the altar was covered with a layer of ashes about 1 inch in thickness, and these ashes had the appearance and composition of having been derived from the burning of animal matter. The antlers and jawbone of a deer were found resting upon the surface of the altar. The edges of the vase, which had been broken off apparently by an accident during the performance of the religious ceremonies, were carefully laid over the layer of ashes, and the whole covered with earth near 3 feet in thickness, and thus the ashes had been preserved to a remarkable extent from the action of the rains.[a]

[a] Jones, Joseph, The aboriginal mound-builders of Tennessee, in American Naturalist, Salem, 1869, vol. III, p. 68.

The altars found in the mounds of the Ohio valley are usually large shallow basins built in place by applying clay to a basin-like depression in the ground and smoothing the surface roughly with the hands or trowels. The altar fires baked the clay, giving it the consistency of earthenware.

Cement and Plaster

Native clays and earths were extensively used in the construction of numerous classes of fixed works, and it is found that various mix-

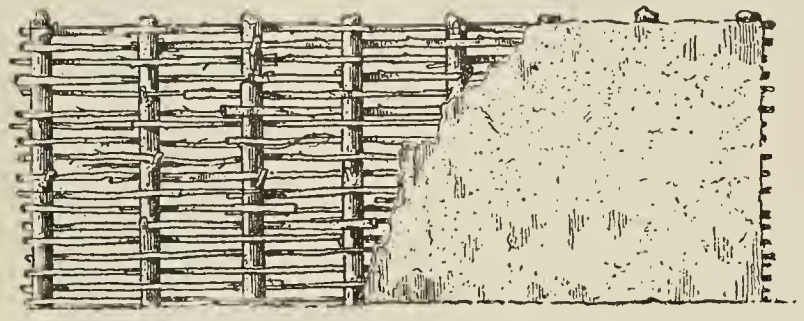


Fig. 8—Use of clay in plastering house wall of interlaced canes, Arkansas. From Thomas, 12th Annual Report of the Bureau of Ethnology, figure 118.

tures—cement-like combinations of clay, sand, gravel, etc.—were employed to add to the firmness of these constructions. In the middle and lower Mississippi valley provinces plastic clay was employed extensively in plastering the walls and roofs of houses of cane and other interlaced vegetal parts, and floors were laid in the same material (see figure 8).

Earthenware Used in Burial

To what extent earthen vessels were used as receptacles for the remains of the dead can not be satisfactorily determined. The whites,

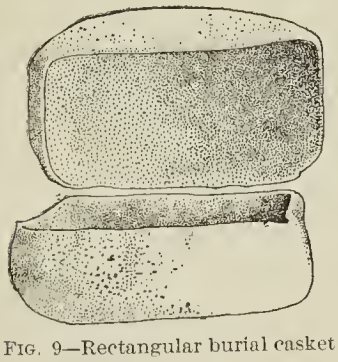


Fig. 9—Rectangular burial casket of earthenware, Tennessee.



Fig. 10—Earthen vessel containing bones of children, Alabama (Moore).

accustomed to the practice of burial of ashes in cinerary urns among eastern nations, were prone to discover traces of similar customs here,

and perhaps made statements on insufficient evidence. It is true, however, that the dead were burned in many sections of the country, and that the ashes or rather, perhaps, the charred remnants of bones were placed in such receptacles as were at hand for burial. The burial of the disarticulated bones of the dead, especially of children, in earthen



FIG. 11—Earthen vessel inverted over a skull for protection, Georgia (Moore).



FIG. 12—Earthenware burial urn and bowl cover, Georgia.

vessels, was quite common in the South Appalachian province and occurred occasionally, at least, in other regions. To what extent vessels were manufactured exclusively for mortuary purposes can not be determined, since no particular form seems to have been considered necessary. The larger boiling or containing pots, taken from the household supply, seem to have been satisfactory. Occasionally, how-

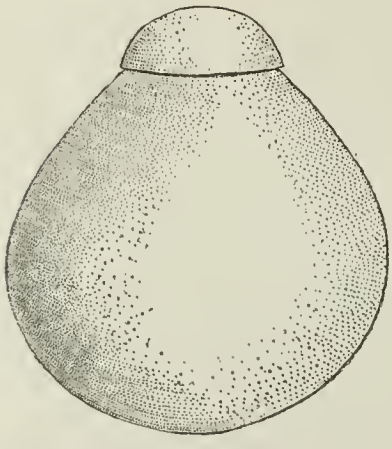


FIG. 13—Earthenware burial urn with cover, Georgia.

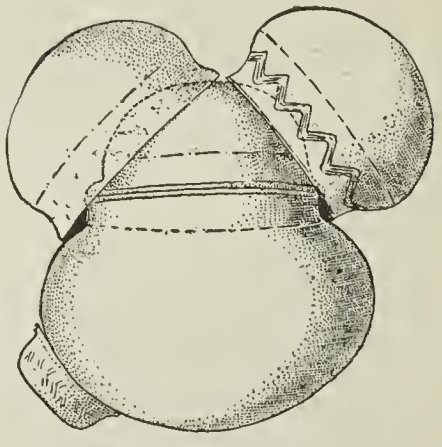


FIG. 14—Earthernware burial urn with bowl cover and other vessels, Alabama (Moore).

ever, receptacles appear to have been shaped for the purpose; the casket shown in figure 9 was of this class. It was obtained from a burial mound at Hale's point, Tennessee, and contained the bones of an infant. Figure 10 shows the top view of a burial vase from a mound in Wilcox county, Alabama, containing bones of infants.

In very many cases earthen vessels, especially bowls, are found inverted over the skull of the deceased, as shown in figure 11, and not infrequently large fragments of earthenware were placed over and around the head, probably as a protection.

The commonest form of pot burial is illustrated in figures 12, 13, 14, and 15. The remains were crowded into the vessel and the bowl was fitted over or into the mouth of this receptacle.

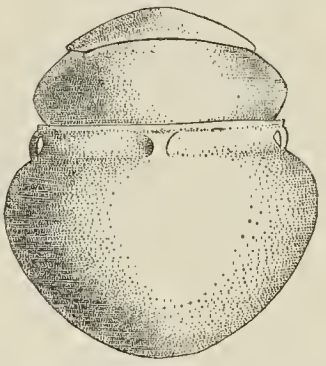


FIG. 15—Earthernware burial urn with bowl cover, Alabama (Moore).

Perhaps the most general use of vases in burial was that of containing food, drink, and other offerings intended by friends of the departed to serve some mythical post-mortem purpose. That the deposition of these articles with the dead had, however, become a mere form or symbol in many cases is shown by the fact that the vessels were often broken and

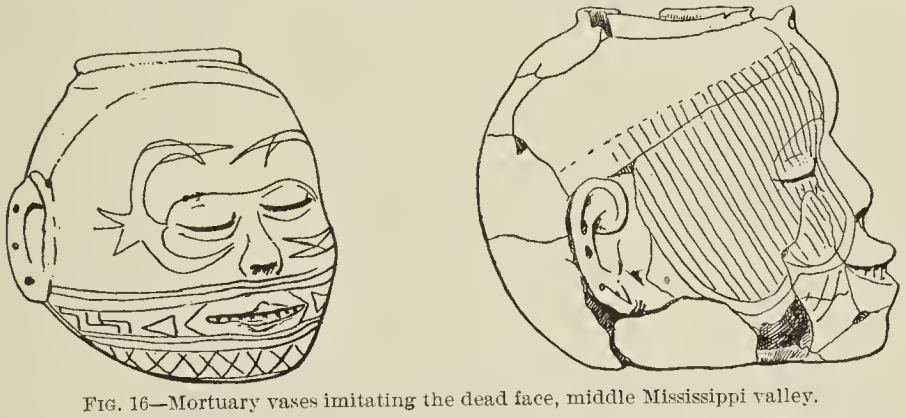


FIG. 16—Mortuary vases imitating the dead face, middle Mississippi valley.

that fragments merely were sometimes used. In one section of the Mississippi valley we find small mortuary receptacles made to repre-

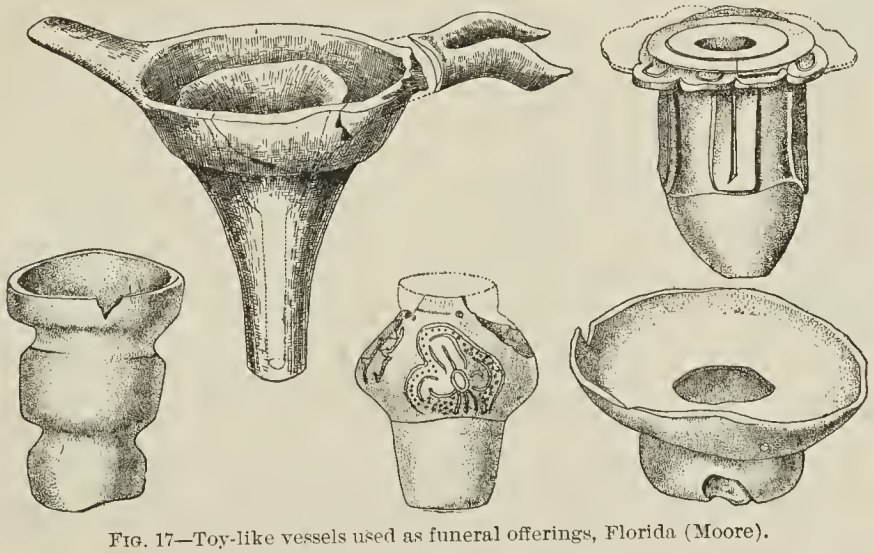


FIG. 17—Toy-like vessels used as funeral offerings, Florida (Moore).

sent the human face as it appears after death. So unusual is the shape that we are justified in assuming that the vessels were made exclu-

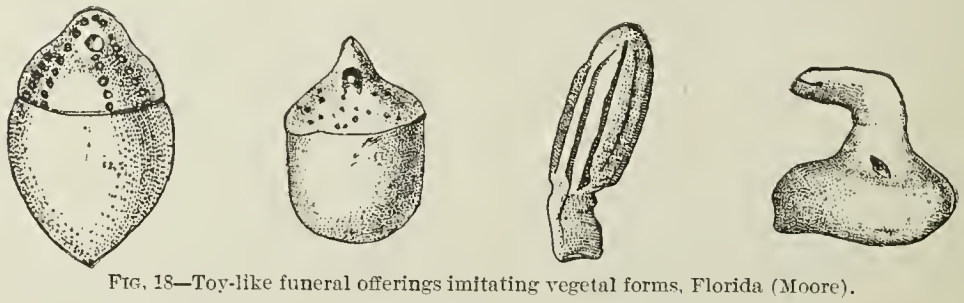


FIG. 18—Toy-like funeral offerings imitating vegetal forms, Florida (Moore).

sively for mortuary use and consignment to the tomb. They are too small to have contained bones, and we can only surmise that they were intended to contain food, drink, or other kinds of offerings. An

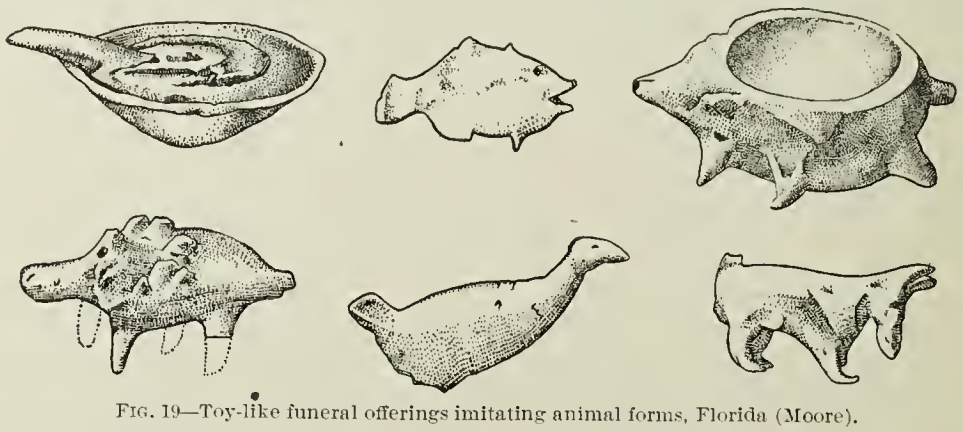


FIG. 19—Toy-like funeral offerings imitating animal forms, Florida (Moore).

example is shown in figure 16, and two excellent specimens appear in plate XLIII. In some other regions, notably in Florida, rude imitations of vessels, hardly capable of bearing up their own weight, were made and cast into the grave (see figure 17). With these were also figurines made in the rudest way, representing many forms of animal and vegetal life, shown in figures 18 and 19.[a] It is possible that these were offerings made after the manner of the ancient Egyptians, who placed images of slaves and various implements and utensils in the tomb, with the idea that they would in some way be of service to the dead in the future existence.



FIG. 20—Toy-like figurine representing babe in cradle, Tennessee (Thruston).

The modeling of various life forms was extensively practiced by

[a] Moore, Clarence B., Certain sand mounds on the St Johns river, Florida, part 1, in Journal of Academy of Natural Sciences of Philadelphia, ser. 2, vol. x, pt. 1, Phila., 1894.

the potters of some sections, but almost universally as elaborations and embellishments of vessels, pipes, and other useful articles. Serious attempts at the modeling in clay of human or animal figures for the figure's sake were apparently quite exceptional, although images in stone are common. Nearly all solid figures in clay so far reported have the character of toys or rude votive or mortuary offerings. The collections of Clarence B. Moore contain many specimens of such burial figurines from the mounds of Florida (see figure 19). General Thruston illustrates a small clay figure representing a babe in its cradle from a mound in Tennessee (figure 20); also the image of a turtle from the Noel cemetery near Nashville (figure 21); and recently Dr Roland Steiner, of Grovetown, Georgia, has forwarded to the Museum a number of small figures of reddish terra cotta in which a variety of physiognomy and facial expression appear (see figures 22 and 23). These figures have a more marked resemblance to Mexican work of the same class than any yet found within the territory of the United States. The flattening out of the head, as seen in profile, is especially noteworthy. They are from the Etowah group of mounds in Bartow county, Georgia.

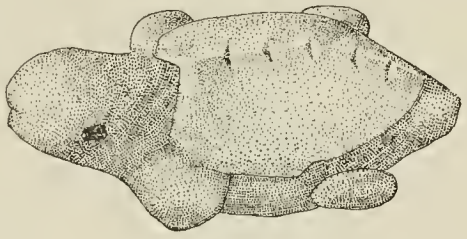


FIG. 21—Small image of a turtle, Tennessee.

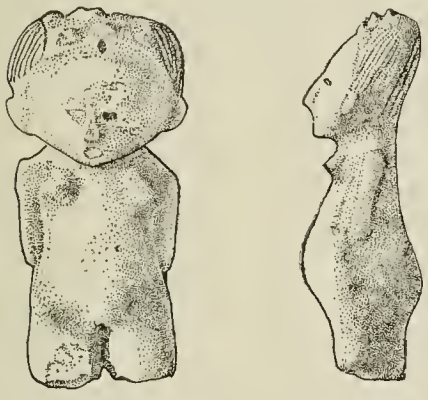


FIG. 22—Small earthenware figures suggesting ancient Mexican work, Georgia.

Strangely enough, the most striking examples of this class of work yet found in the eastern United States are from a region where the ordinary wares are inferior and not very plentiful. I refer to some



FIG. 23—Earthenware heads of Mexican type, Georgia.

specimens of small figurines in clay obtained by Professor F. W. Putnam from a mound in southwestern Ohio. They appear to excel any similar work north of Mexico in the appreciation of form and

proportion shown by the makers, but illustrations have not as yet been published.

The occurrence of such unusual features of art as this and the flat-headed figurines mentioned above, adds force to the suggestion afforded by certain unique works in stone, copper, and shell found in the general region, that some of the early people had contact, more or less direct, with the advanced nations of Mexico.

Personal Ornaments of Earthenware

Clay, colored by a variety of oxides and other substances, was extensively used for painting the person as well as various objects of art, but

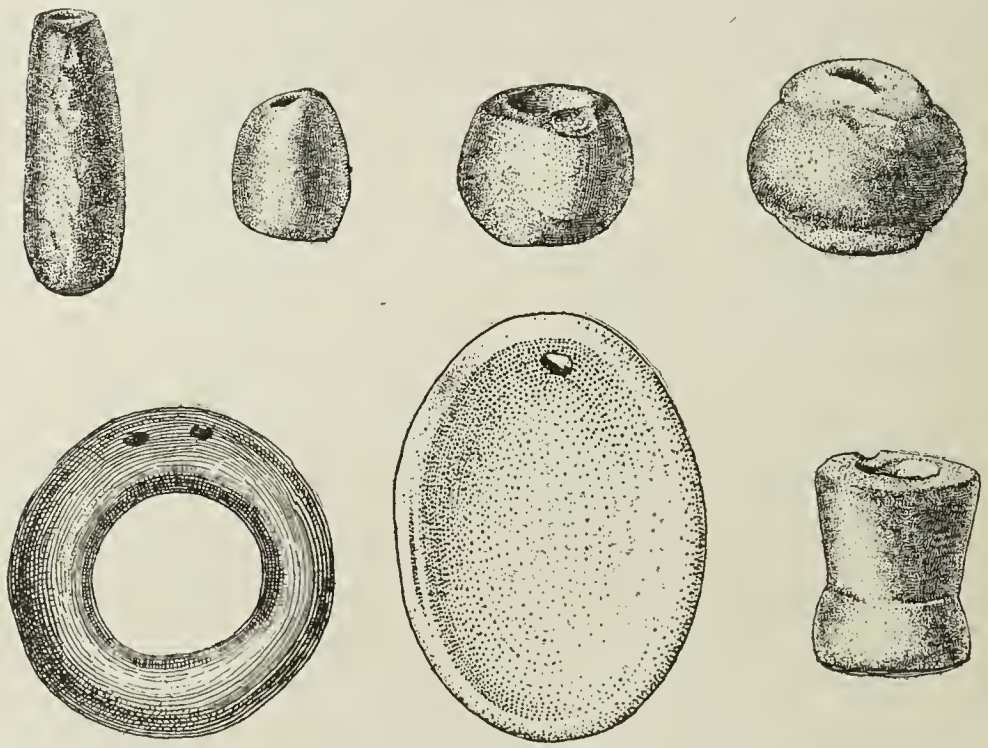


Fig. 24—Earthenware beads and pendants, various localities.



Fig. 25—Ear plugs of earthenware, middle and lower Mississippi valley.

articles of baked clay were rarely utilized for ornament. Occasionally baked clay was employed for beads and pendants (see figure 24),

and for ear plugs and labrets (figures 25 and 26), in the same manner as were similar forms in stone and shell, but this use was not common, as the material was not sufficiently attractive in appearance to gratify the savage taste.



FIG. 26—Labrets of earthenware, middle and lower Mississippi valley.

EARTHENWARE DISKS AND SPOOLS

From many sections of the country we have small earthenware disks, generally shaped from potsherds, and in some cases perforated. They average between 1 and 2 inches in diameter, and are in many cases very carefully rounded and finished. They are obtained from dwelling sites, and occasionally from graves. One theory as to their function is that they were used in playing games of skill or chance. The perforate variety may in cases have been used as spindle whorls, but recently Mr Clarence B. Moore has found specimens so related to human remains in burial as to lead to the conclusion that they had served as cores for copper ear disks. Examples are presented in figure 27.



FIG. 27—Pottery disks, probably used in playing some game.

Among the imperfectly understood varieties of earthenware objects are some spool-like forms found in the Ohio valley. Illustrations of two specimens found near Maysville, Kentucky, appear in figure 28. The following notes regarding them are furnished me by Mr Gerard Fowke, of Chillicothe, Ohio:

I have seen a few, probably 15 or 20, of these "spools," though I am at a loss to classify them. A few are drilled [longitudinally] through the center. The figures engraved represent, perhaps, the extremes of slenderness and thickness in propor-

tion to length. So far as my knowledge of them goes they are found only in Lewis, Fleming, Mason (of which Maysville is the county seat), Nicholas, and Bracken counties, Kentucky, and Brown and Adams counties, Ohio—all these counties being contiguous. It is reported that one was found in Ross county and one in Scioto county, Ohio.

While there is considerable variation in the incised lines, they all seem to be modifications of the two systems in the specimens illustrated.



FIG. 28—Spool-shaped articles of clay, containing unusual designs in incised lines. From a photograph furnished by Thomas W. Kinney, Portsmouth, Ohio.

EARTHENWARE TOBACCO PIPES

Pipes for smoking tobacco and other dried plants were generally made of vegetal substances or of stone, but in some sections clay was much used. Smoking as a matter of gustatory gratification was a widespread custom, and many accounts agree in making it an important feature in magic, religious ceremonials, councils, and treaties.

There is probably no good reason to question the general belief that the pipe was in use in America on the arrival of Europeans. Specimens are found in such varied situations and, besides, the shapes are so highly differentiated that any other conclusion must needs be supported by strong evidence. The simplest form of the pipe is a straight tube, found only now and then in the East, but the prevailing form on the Pacific coast. In the northeastern states the fundamental shape is a nearly plain bent tube slightly enlarged at the bowl end, represented in the most elementary form by the pipes of the Chesapeake province, and appearing in more elaborate shapes in the Iroquoian region in Pennsylvania and New York. The short, wide-bowled, bent trumpet of the South Appalachian province is a local development of the same general type, and the clumsy, massive, bent tube of the Gulf and Middle Mississippi states is a still more marked variant. The monitor and platform shapes of the Central states depart widely from the simple tube, and no end of curious modifications of form come from changes in the relative proportions and positions of

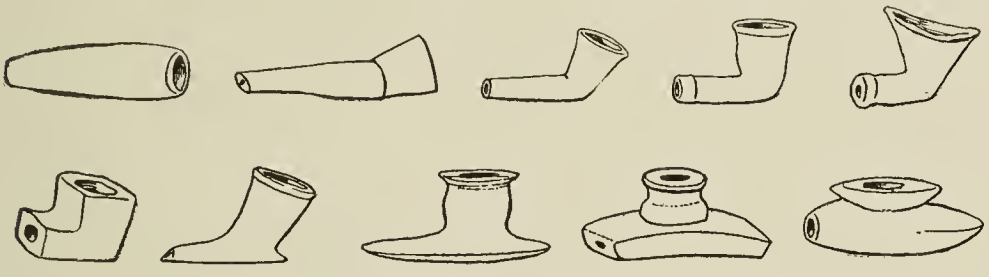


Fig. 29—Range in form of tobacco pipes.

stem and bowl, and especially from the addition of plastic life forms in almost infinite variety. A synopsis of the range of form from the straight tube to the platform with discoid bowl is given in figure 29. It is remarkable that the great Ohio Valley province and the Middle South, furnishing stone pipes of the highest grade, yield few and rude pipes of clay. Pipes were smoked with or without stems of other material. Illustrations and descriptions of type specimens will be given as the various groups of ware to which they belong are presented. A comprehensive work on American tobacco pipes has been published recently by the National Museum.[a]

MATERIALS

Clay

Clay suited to the manufacture of the plain earthenware of the aborigines is widely distributed over the country, and it is not likely that any extended region is without a plentiful supply. The clay used was often impure, and in many cases was probably obtained from

a McGuire, J. D., Pipes and smoking customs, Report of the United States National Museum, 1897.

recently deposited alluvial sediments. Clean clays were, however, diligently sought and generally procured, and in many cases they seem to have been carefully prepared by pulverizing, washing, and kneading, as was observed by Dumont and others. Finely prepared washes of clay were made for surface finish. Clay unmixed with any kind of tempering was sometimes used for modeling vessels, pipes, and some of the less important articles. The more advanced potters used paste having degrees of refinement suited to the nature of the object modeled. Utensils to be used over fire were tempered with coarser ingredients.

Tempering Materials

Great diversity of tempering materials is observed. This diversity is due to the multiplicity of mineral products brought within the range of experiment. It is apparent that many materials were suited to the purpose. The choice of a single material, where many abounded, must have been due to accident in the incipient stages of the art. It is not uncommon, however, to find several substances used in the work of a single community—or what appears to be such. The ingredients varied to some extent also with the uses to which the vessels were to be devoted. They include pulverized rocks and mineral substances of many kinds, powdered shells of mollusks, powdered potsherds, and perhaps cinders, besides ashes of bark, sponge, and the like. Raw vegetal substances were also used, the fibrous parts being broken or pulverized.

The advantages to be secured by the introduction of foreign particles into the clay may be somewhat diverse. It is fair to assume that tempering was intended to impart some quality or property to the paste that the pure clay did not possess to the desired degree. In building vessels the clay may have been handled with greater facility through the introduction of sand, but this could not be true of the addition of coarse, sharp particles of shell or crystalline rock; their presence must really have added to the difficulty of shaping and finishing the vessel.

Tempering may have served a useful purpose during the drying and baking of the clay. It is well known that pure clay has a strong tendency to shrink and crack in drying, and it is readily seen that the particles of tempering material would in a measure counteract this tendency. The coarse particles would interfere with the progress of the parting movements; the undulations that separate finer particles with ease would produce no effect. The progress of a crack would be impeded, just as a fracture in a glass plate is stopped by boring a hole at the extremity of the flaw. It would thus appear that even cavities in the paste serve a useful purpose, and that sawdust and cut straw, even if reduced to ashes by firing, would have performed in a way the functions of tempering. In a fine-grained paste the flaw would, when

once started, continue through the wall of the vessel in a direct line without interference. In the tempered paste it would, in avoiding the solid particles, or through interference of cavities take a sinuous course or be led off in diverging directions.

Again, any condition or ingredient that reduces the amount of contraction resulting from drying out during the baking process must be advantageous. It may be possible for a body of clay to contract so evenly as to suffer no injury, yet, as a rule, there must be considerable unevenness of contraction, with consequent danger, and it would seem that the greater the contraction the greater the danger of disaster. Clay contracts through the evaporation of water held between the minute particles. The coarse particles of tempering may contain water, but, being rigid, they do not contract on drying out. The amount of contraction would thus be reduced in direct ratio with the increase of tempering material, and this would seem a most important consideration to the potter.

It may be further surmised that the presence of foreign particles in the clay may serve some purpose in connection with the distribution of the heat in firing or in subsequent use over fire. The points reached by a given degree of heat in pure clay may be on or close to a particular line or plane and may thus give rise to distinctly localized strain, whereas the foreign particles may tend to conduct the heat unevenly and distribute the strain.

In reference to the function of the tempering material during the subsequent use of the vessel, it might seem that the presence of large fragments of hard substances would weaken the wall of the vessel so that when in use it would readily be fractured by a strain or blow; but the particles arrange themselves so that strong points alternate with the weak ones in such a way as to increase strength rather than to reduce it. It appears further that the particles of tempering, especially if coarse, must add greatly to the toughness of the paste during the use of the vessel, much as they do during the drying-out process, and it is not impossible for a flaw to extend entirely through and across a vessel, and still not seriously impair its strength, as the particles of tempering are so interlocked or dovetailed that separation can not readily take place. It would appear, therefore, that the offices of the tempering ingredient are almost purely physical, and not chemical. In America the heat employed in firing earthenware was not sufficient to seriously alter any of the mineral constituents. It rarely happened that the heat was sufficient to calcine the shell material with which the clay in many sections was filled.

The favorite tempering materials were powdered shell and pulverized crystalline rock. Sand, the grains of which were rounded, and various other materials, so finely powdered as to be almost impalpable, were often employed. In the piedmont regions of North Carolina and

Virginia vessels are found made of paste consisting of coarsely pulverized steatite and barely enough clay to hold the particles together. Mica, iron pyrites, and other crystalline substances were much used in some sections. It is not uncommon to see examples in which the paste contains 75 or 80 per cent of the tempering ingredients.

The use of powdered shell was very general. It is not known that any particular variety of shell was preferred. The shells were pulverized in mortars or by means of such devices as were at hand. Du Pratz observed their use in early times. He remarks that—

> Near the Nactchitoches are found banks of shells ["Coquilles de Palourdes"] such as those which form the shell island. This neighboring nation says that ancient tradition teaches them that the sea was formerly extended to this spot; the women of this nation come here to gather them [the shells]; they make a powder of them and mix it with the earth of which they make their pottery, which is considered the best. However, I would not advise the indiscriminate use of those shells for this purpose, because by nature they crack when exposed to fire; I think, therefore, that those which are found among the Nactchitoches have acquired this good quality only by losing their salt during a period of several centuries that they have been out of the sea.[a]

It is rather remarkable that in many, if not in a majority of cases, the bits of shell have not been affected by the heat of baking or use, as their original luster is fully preserved. The Pamunkey Indians of Virginia, who were found practicing the art of pot making only a few years ago, calcined their shells, and, as a consequence, where a large percentage of the material was used in tempering the clay, the vessels are inclined to fall to pieces from the slacking that follows use in water.

MANUFACTURE

The Records

A careful study of the methods and processes of manufacture employed in the ceramic art of America must furnish much that is of interest to the student of technic evolution. Besides this, the intimate knowledge of the art gained in the study of the technique of manufacture may also be of value when applied to questions of a more purely ethnic nature, for peculiar methods and devices of art characterize the peoples employing them, and in connection with other classes of evidence may be of use in tracing and identifying peoples. Much remains to be done in this branch of the study, for, considering the fact that the ceramic art has been so generally practiced by the natives since the advent of Europeans, our knowledge of the methods of manufacture seems very meager. Those whites who came in contact with the aborigines most intimately took very little interest in the native arts, and, as a rule, made no record of them whatever, and now, when interest is finally awakened, we find these arts in the main superseded and lost.

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[a] Du Pratz, Antoine Simon Le Page, Histoire de la Louisiane, Paris, 1758, vol. I, pp. 163–164.

Our knowledge of the technic of the art is fortunately not limited to that furnished by literature or by observation of modern practices. An examination of the many relics preserved to our time throws much light on the methods of fictile manipulation. The potter's fingers have left an indelible and easily read record upon every sherd. Slips, enamels, and glazes which tend to obscure evidences of manipulation had not come into use or were sparingly employed, and the firing was so slight as to leave all the ingredients, save in color and hardness, practically unchanged.

First Use of Clay

Clay was probably first employed in the unbaked state as an auxiliary in various arts, but in such a simple manner that traces of the work are not preserved to us. The beginnings of the use of utensils of baked clay by our northern tribes must have been of comparatively recent date, but these incipient stages are necessarily obscure. If the art was of local origin a long series of almost imperceptible steps must have led up to successful methods of shaping and baking. Suitable clays would have to be discovered and brought into use, and it would be long before the intelligent use of tempering materials and advanced methods of manipulation were known.

Shaping Processes and Appliances

The shaping processes employed in vessel making were chiefly modeling and molding. These operations are equally elementary and probably of nearly equal antiquity, or, what amounts to the same thing, they came into use at corresponding stages of culture. If, as has been suggested, the clay vessel originated with the employment of clay as a lining for cooking pits, or in protecting baskets, fruit shells, or other articles from destruction by fire in culinary operations, the clay would be applied to, and would take the form of, the pit or vessel, and the art of molding would be suggested. Modeling began with the first touch of the fingers to a plastic material, but modeling directed to a definite end—the art of modeling—did not begin until some desired form was designedly reproduced. The assumption that the vessel was the first art form in baked clay may or may not be well founded, but that it soon became and always remained the most important product of the potter's art must pass unchallenged.

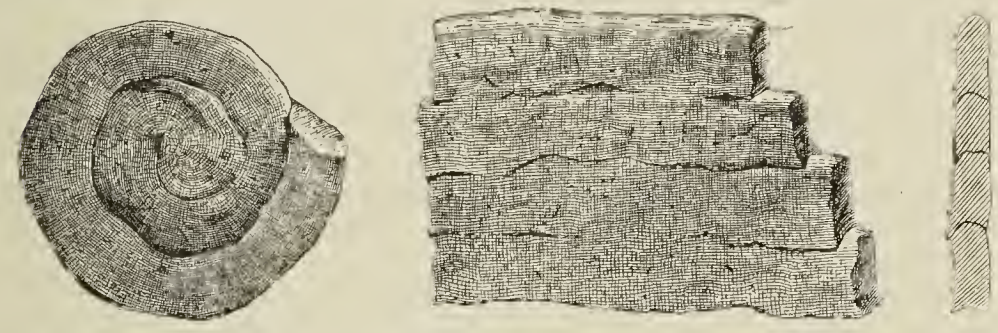
Although the molding process was much used in archaic times, it alone was never competent to complete a utensil; the plastic clay had to be squeezed into the mold and was therefore shaped, on one side at least, by modeling with the fingers or an implement. On the other hand, modeling alone was capable of accomplishing every necessary part of the shaping and finishing of vessels.

There has been much discussion regarding the probable nature of the mechanical appliances in use by pre-Columbian potters. It is now well established that the wheel or lathe was unknown in America, and no substitute for it capable of assisting materially in throwing the form or giving symmetry to the outline by purely mechanical means had been devised. The hand is the true prototype of the wheel as well as of other shaping tools, but the earliest artificial revolving device probably consisted of a shallow basket or bit of gourd in which the clay vessel was commenced and by means of which it was turned back and forth with one hand as the building went on with the other. This device is illustrated farther on in connection with studies of textile appliances employed in the art.

Within the United States molds were generally, though not always, improvised affairs and seldom did more than serve as a support for the lower part of the clay vessel during shaping and finishing by the modeling processes. These molds were employed either as exterior or interior supports, to be removed before the baking began or even before the vessel was finished. They consisted of shallow baskets, sections of gourd shell, and vessels of clay or wood shaped for the purpose. The textile markings so often seen on the exterior surfaces of vases are not, however, impressions of baskets employed in modeling and molding, but of pliable fabrics and cords used, possibly, in supporting the vessel while in the process of construction, but in most cases as a means of shaping, texturing, and ornamenting the surface, and applied by successive imprintings or malleations. This topic is presented in detail toward the close of this section.

It is apparent that the actual process of building and shaping an ordinary vessel was in a general way much the same, no matter whether it was supported by a shallow vessel serving as a rudimentary mold or wheel, or whether it was the work of the hands unaided by such mechanical device. The work was commenced at the center of the rounded bottom, either with a small mass of clay, which was flattened out and modeled into the proper curve by pressure of the fingers, or with the end of a strip of clay coiled on itself and welded together and worked into the desired form. In either case the walls were, as a rule, carried upward from the nucleus thus secured by the addition of strips of clay which were often so long as to extend more than once around the growing rim, thus assuming the character of a coil. Coil building was practiced in a very skillful manner by the ancient Pueblos. With these people the strips of clay were cut and laid on with the utmost regularity, and the edges were made to overlap on the exterior of the vessel, forming spiral imbrications. In the eastern United States the strips of clay were wide, irregular, and rude, and were worked down and obliterated, the finished vessel rarely showing

traces of their employment. The strips were not systematically overlapped as they were with the Pueblos, but one turn was set somewhat directly on the edge of the preceding turn and was attached to it by pressure and by drawing down the edges, both exterior and interior. Specimens from many sections fracture along the strip junctions, thus revealing the width of the fillets and the manner of their manipulation. The beginning of a coil is shown in figure 30*a*. Attachment was accomplished by drawing both edges of the fillet down over the convex edge of the preceding turn, as is seen in *b* and *c*. Commonly the walls were evened up and the form corrected and developed by the aid of modeling tools. A convex-surfaced implement, a piece of gourd, for example, was held on the inner surface to support the wall, while paddles, rocking tools, and scrapers were used to manipulate the exterior surface. When the body of the vessel had been brought into approximately final shape, the margins—or in constricted forms the neck and rim—



a *b* *c*

FIG. 30—Use of the coil in vessel building: *a*, beginning of coil; *b*, ordinary superposition of coils or strips; *c*, section.

received attention. Handles, legs, and other relieved features, including ornaments, were shaped and added, and the points of junction were carefully finished off. In the case of compound or even of complex forms the parts were separately shaped and afterward joined by pressure and rubbing. Surface finish was accomplished in a number of ways, varying with the people, the period, and the locality, and with the use to which the vessels were to be applied. The most elementary treatment consisted of rubbing the surface with the hand and finger tips. But various tools were used, each leaving its own characteristic markings, and these in the more ordinary ware served as an ornamental finish. In the better ware the surface was rubbed down and polished with smooth stones or bits of shell.

DECORATING PROCESSES

When the vessel was built and practically complete, attention was turned toward decoration. During the shaping operations features of form and texture very often arose that proved pleasing to the potter,

and these were preserved and elaborated. Thus the potters of each community, each nation, developed their own set of devices for decorating, besides acquiring from associated arts and from neighboring peoples additional ideas and facilities by means of which their art was gradually enriched.

The fingers and fingernails were employed to produce many rude effects in relief and in intaglio; tools of many shapes, improvised or manufactured for the purpose, were used; sharp pointed ones to incise, gouge-like forms to excavate, dull and rounded points to trail, and all the varieties for indented designs. Of kindred nature is a species of rude inlaying, which consists of setting into the clay, in patterns, bits of colored mineral, such as mica and quartz.

In some sections of the country engraved stamps, which generally took the form of paddles, were used to cover the plastic surface with diaper-like patterns; in others thin disks with indented or otherwise finished peripheries were rolled back and forth on the plastic surface, producing similar figures. Again, in many places woven fabrics were applied to the clay, leaving artistic patterns, and cords were impressed to produce ornamental figures of textile character. Then again processes of preparing and applying color were known in some sections and extensively employed. Clays of varying hues were ground and prepared in a liquid state to be applied with brushes. The surface was in cases prepared for the color by the addition of a layer or wash of fine paste. No description of the processes of applying the colors has been recorded, but they are probably not unlike those practiced in the Pueblo country today, and may have been borrowed by the people of the lower Arkansas from their Pueblo neighbors or from nations inhabiting the western or southern shores of the Gulf of Mexico.

Baking Processes

When completed the utensil was dried in the shade, in the sun, or before the fire, according to the needs of the case or to custom; afterward it was baked with greater or less thoroughness. The Catawbas, it would seem, having excellent clay, found baking before the fire quite sufficient. The Cherokees embedded the vessel in bark, which was fired, and the vessel came out red-hot. In no section was a very high degree of heat intentionally applied and the paste remained comparatively soft. The shell material used in tempering was often not calcined, and vitrification rarely took place. Such traces of vitrification as have been observed may have been produced long subsequent to the original baking. It has often been stated that furnaces prepared for the purpose of firing earthenware have been identified, but it is difficult to substantiate this belief, as the phenomena observed may be due to the use of earthenware in connection with fireplaces or with kilns built for other purposes.

Methods of firing observed in use were extremely simple and consisted usually of devices for surrounding the vessels somewhat evenly with burning fuel. By such means the paste was hardened, and, in most cases discolored, taking a variety of hues depending on its mineral ingredients and on the manner of applying the fire and the degree of heat attained. Some of the effects of color observed are undoubtedly due to causes operating at a period subsequent to the original firing. In cases where pigments were used in surface finish or in ornamental designs it can not be determined whether or not changes in hue produced by chemical reactions in baking were anticipated and relied on to produce desired results.

Processes of Manufacture in Present Use

Authors from whom information derived from personal observations can be obtained are very few in number, and up to the present time no detailed account of the manufacture of earthenware in the great province covered by this paper has been published. The best accounts are casual notes by writers who sought only to entertain, or who had little conception of the subject with which they were dealing. Perceiving this I sought means of securing detailed and accurate information. In 1888, learning that Mr James Mooney, the indefatigable student of aboriginal history, was about to pay a visit to the Cherokee villages of western North Carolina, I secured his aid. Armed with a list of topics furnished by me he made a careful study of the art as practised among these peoples, and from his notes have been compiled the two valuable accounts which follow:

Manufacture by Catawba Women

Living with the Cherokees were (in 1890) two Catawba women, Sally Wahuhu, an old woman of 80 years, who had come from the Catawba reservation in South Carolina about fifty years before, and Susanna Owl, about 40 years of age, who had been with the Cherokees four years. These women, being skilled potters, were induced to make some vessels, that Mr Mooney might witness the operations. Their methods were probably in the main Catawban, but the manner of baking, by means of which a rich black color was given to the ware, was said by the elder woman to have been acquired from the Cherokees. She also maintained that the Catawbas did not burn their wares in the fire, but baked them before it.

On the Cherokee reservation two kinds of clay are used. They are found mainly on the north bank of the Soco creek, in Jackson county, North Carolina, and are usually closely associated in their deposition. One variety is fine-grained and of dark brown color; this is used for pipes, because it readily takes a high polish. The other variety is light gray or whitish in color and contains sand so coarse as to give it a gritty texture. For the manufacture of ordinary earthenware these

clays are mixed in about equal proportions; they are placed together and pounded with a stick or with such tools as happen to be convenient. By adding water a paste of about the consistency of putty is soon produced, which in this state is ready for use; it may, however, be preserved an indefinite period provided it does not freeze.

In making a vessel a sufficient quantity of the paste was placed by the Catawba women on a board and rolled into cylinders about an inch thick, which were cut up into sections eight or ten inches long. A small mass of clay was then taken, from which a disk about five inches in diameter was formed; this, turned up at the edges, served as the bottom of the vessel. It was placed on a board and one of the strips of clay, properly flattened out, was carried around its circumference and broken off on completing the circuit. The margin was bent slightly upward and the junction was rubbed over with the thumb nail to unite it. The process was repeated until the bowl was complete, the last strip being turned slightly outward with the fingers to form the rim. The joints were then rubbed over with the nails, and the whole surface, inside and out, was rubbed with a piece of gourd shell until it became quite even. During the smoothing process the vessel was beaten with the hands and dexterously turned by tossing in the air. The work up to this point had occupied about fifteen minutes. In the case of vessels requiring ears or handles, small cylinders of stiff clay were shaped, set in holes bored through the vessel, and clinched inside, and the joints were carefully smoothed over. The vessel was then allowed to dry until the next day. Having remained in the sun for a number of hours it was again placed on a board which was held in the lap and the surface was scraped with a bit of gourd shell until the walls were sufficiently thin and even. Some parts, including the edges, were pared off with a knife. When the scraping or paring dislodged grains of sand, the holes were filled with bits of clay from the bottom of the vessel and the surface was smoothed over with the fingers. The surface was now rubbed over with the gourd shell and polished with a smooth pebble which, in this case, had been brought from South Carolina by the elder woman. This part of the process, occupying about fifteen minutes, finished the second day's work.

After the vessel had dried until the afternoon of the third day, in the sun, as far as possible, the surface was again rubbed inside and out with the polishing stone. This work occupied half an hour. After this the vase was placed before the fire where not exposed to drafts and dried or baked for an hour; it was then ready for firing, which was conducted indoors. Oak bark was used for firing; Sally Wahuhu stated that poplar bark gave a superior color and finish. Bark was preferred to wood because it was more easily broken up and was more convenient. A heap of bark was laid on a bed of living coals; the vessel was filled with broken bark and inverted over the pile of ignited bark and then completely covered with the same fuel. The

exterior bark was fired and the supply renewed for an hour, when the red-hot vessel was taken out. It was kept away from drafts during the burning and the first part of the cooling to prevent cracking. It was allowed to cool near the fire until the red heat had disappeared, when it was removed to the open air. On examination it was found that the inside had been colored a deep, glistening black by the burning, but the exterior, save in spots where the bark had been dense and the fire much smothered, was of grayish and reddish tints.

The Catawba potters excel in the manufacture of pipes. Susanna Owl used only the fine brown clay. In making an ordinary pipe she first rolled out a cylindric cone about five inches long, one end of which was less than half an inch in diameter and the other an inch or more. This cone was broken in the middle and the narrow piece was joined to the other near the smaller end and at right angles, the junction being perfected by the addition of bits of clay and by manipulation with the fingers. The processes of shaping, polishing, and drying were the same as with ordinary pottery. Three other varieties of pipes are made, described severally as cockscomb-shaped, ax-shaped, and boot-shaped. Incised ornamental figures are executed with a needle or a bent pin. This work is done on the evening of the second day or on the morning of the third. The bowl is not bored out until the pipe is nearly ready for firing. The pipes are baked, often several at a time, by embedding in burning bark, and a vessel is inverted over them during the process to impart a uniform glistening black finish.

The work of the Catawba potters was observed by Dr E. Palmer on their reservation in South Carolina in 1884, and somewhat detailed notes were furnished by him to the Bureau of Ethnology. They use a light porous clay containing a large percentage of vegetal matter. It is moistened, then taken in the hands by bits, and kneaded by the fingers until all hard particles are removed and the texture becomes uniform. When enough is thus treated to make a vessel, a small portion is taken up and flattened between the hands and formed into a disk. This is placed on a board, and other portions are rolled out into rolls a foot or less in length. One of these is wrapped about the margin of the disk and worked down and welded with the fingers, and others are added in like manner until the walls rise to the desired height. When the surface is made sufficiently even and the clay becomes firm, smooth quartz pebbles are used to give a polish.

The vessels are carefully dried in the shade and then baked by covering them with bark which is kept burning until they are sufficiently hardened. They are frequently moved about to prevent such constant contact with the burning bark as would blacken them too much. The colors produced are shades of brown mottled with grays and blacks. When the potters desire they produce a black shining surface by covering the articles with some inverted receptacle during the baking process.

MANUFACTURE BY CHEROKEE WOMEN

Mr Mooney found that although the making of pottery had fallen into disuse among the Cherokees, three women were still skilled in the art. The names of these potters are Uhyûñli, then 75 years of age, Katâlsta, about 85 years of age, and Ewi Katâlsta, daughter of the last named and about 50 years old.

Cherokee processes differ from the Catawba, or more properly, perhaps, did differ, in two principal points, namely, *a*, the application of a black glossy color by smother-firing, and, *b*, the application of ornamental designs to the exterior of the vessel by means of figured paddles or stamps. The employment of incised decorations was more common among the Cherokees than among the Catawbas.

Katâlsta used clay of the fine dark variety obtained near Macedonia Church. She prepared it as did the Catawba women, but in building she sometimes used one long coil which was carried spirally from the bottom to the rim after the manner of the ancient Pueblos and the potters of Louisiana. The inside of the vessel was shaped with a spoon and polished with a stone, the latter having been in use in the potter's family, near Bryson City, North Carolina, for three generations. The outside was stamped all over with a paddle, the body of which was covered with a checker pattern of engraved lines, giving a somewhat ornamental effect. The rim was lined vertically by incising with a pointed tool. At this stage of the process the vessel was lifted by means of a bit of cloth which prevented obliteration of the ornaments. When the vessel was finished and dried in the sun it was heated by the fire for three hours, and then put on the fire and covered with bark and burned for about three-quarters of an hour. When this step of the process was completed the vessel was taken outside the house and inverted over a small hole in the ground, which was filled with burning corn cobs. This fuel was renewed a number of times, and at the end of half an hour the interior of the vessel had acquired a black and glistening surface. Sometimes the same result is obtained by burning small quantities of wheat or cob bran in the vessel, which is covered over during the burning to prevent the escape of the smoke.

The implements used by the potters of this reservation are the tool for pounding the clay; the bits of gourd or shell, or other convex-surfaced devices for shaping and polishing; the knife for trimming edges; smooth pebbles for final polishing; pointed tools of wood, metal, etc., for incising patterns; and paddle stamps for imparting a rude diapered effect to the exterior surface of the vessel. The stamp patterns are usually small diamonds or squares, formed by cutting crossed grooves on the face of a small paddle of poplar or linn wood.

Plain pipes of rather rude finish are made by the Cherokees after their ordinary manner of earthenware manufacture.

Early Accounts of Manufacture

For the purpose of showing the close general resemblance of the processes here recorded to those of Louisiana Indians witnessed, though inadequately described, by Du Pratz and Butel-Dumont one hundred and fifty years ago, I add the following paragraphs from these authors, quite literally translated.

As soon as these peoples had settled in a fixed dwelling place, it was necessary to find the safest and most convenient method of cooking maize and meats; they bethought themselves of making pottery. This was the work of the women. They sought for greasy earth, reduced it to powder, rejected the gravel which was found in it, made a sufficiently firm paste, and then established their workshop on a flat block of wood on which they formed the pottery with the fingers, smoothing it with a pebble, which was carefully preserved for this purpose. As fast as the clay dried they added more, supporting it with the hand on the other side; after all these operations they baked it by means of a hot fire.[a]

The following is from Butel-Dumont:

Moreover, the industry of these Indian girls and women is admirable. I have already reported elsewhere with what skill, with their fingers alone and without a turning lathe they make all sorts of pottery. This is the method they employ:

After having gathered the earth suitable for this kind of work, and having well cleansed it, they take shells which they grind and reduce to a very fine powder; they mix this very fine dust with the earth which has been provided, and, moistening the whole with a little water, they knead it with the hands and feet, forming a dough of which they make rolls 6 or 7 feet long and of whatever thickness is desired. Should they wish to fashion a dish or a vessel, they take one of these rolls and, holding down one end with the thumb of the left hand they turn it around with admirable swiftness and dexterity, describing a spiral; from time to time they dip their fingers in water, which they are always careful to have near them, and with the right hand they smooth the inside and outside of the vessel they intend to form, which, without this care, would be undulated.

In this manner they make all sorts of utensils of earth, dishes, plates, pans, pots, and pitchers, some of which contain 40 and 50 pints. The baking of this pottery does not cause them much trouble. After having dried it in the shade they build a great fire, and when they think they have enough coals they clear a place in the middle where they arrange the vessels and cover them with the coals. It is thus that they give them the baking which is necessary. After this they can be placed on the fire and have as much firmness as ours. Their strength can only be attributed to the mixture which the women make of the powdered shells with the clay.[b]

A few additional accounts of the making of earthenware by the tribes of the region under review may be quoted. The statements of persons who have not themselves witnessed the processes of manufacture may in cases be vitiated by information derived through unreliable sources and should always be carefully considered with this possibility in view.

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[a] Du Pratz, Antoine Simon Le Page, Histoire de la Louisiane, Paris, 1758, vol. II, pp. 178–79.

[b] Butel-Dumont, George Marie, Mémoires sur la Louisiane, Paris, 1753, vol. II, pp. 271–73.

Hunter, who is one of the best early authorities on the Osages and other Indians of the Missouri and the upper Mississippi regions, makes the following statement:

In manufacturing their pottery for cooking and domestic purposes, they collect tough clay, beat it into powder, temper it with water, and then spread it over blocks of wood, which have been formed into shapes to suit their convenience or fancy. When sufficiently dried, they are removed from the molds, placed in proper situations, and burned to a hardness suitable to their intended uses.

Another method practiced by them is to coat the inner surface of baskets made of rushes or willows with clay, to any required thickness, and, when dry, to burn them as above described.

In this way they construct large, handsome, and tolerably durable ware; though latterly, with such tribes as have much intercourse with the whites, it is not much used, because of the substitution of cast-iron ware in its stead.

When these vessels are large, as is the case for the manufacture of sugar, they are suspended by grapevines, which, wherever exposed to the fire, are constantly kept covered with moist clay.

Sometimes, however, the rims are made strong, and project a little inwardly quite around the vessels, so as to admit of their being sustained by flattened pieces of wood, slid underneath these projections, and extending across their centers.[a]

These paragraphs appear to apply to the Osage Indians and probably to their neighbors.

Mr Catlin's account of the manufacture of pottery by the Mandans of the upper Missouri is a valuable addition to our knowledge. Although often quoted it should not be omitted from this paper.

I spoke also of the earthen dishes or bowls in which these viands were served out; they are a familiar part of the culinary furniture of every Mandan lodge, and are manufactured by the women of this tribe in great quantities, and modeled into a thousand forms and tastes. They are made by the hands of the women, from a tough black clay, and baked in kilns which are made for the purpose, and are nearly equal in hardness to our own manufacture of pottery, though they have not yet got the art of glazing, which would be to them a most valuable secret. They make them so strong and serviceable, however, that they hang them over the fire as we do our iron pots, and boil their meat in them with perfect success. I have seen some few specimens of such manufacture, which have been dug up in Indian mounds and tombs in the Southern and Middle states, placed in our Eastern museums, and looked upon as a great wonder, when here this novelty is at once done away with, and the whole mystery; where women can be seen handling and using them by hundreds, and they can be seen every day in the summer also, molding them into many fanciful forms and passing them through the kiln where they are hardened.[b]

That the art was very generally practiced even by the less sedentary tribes of the great Missouri basin is attested by the following extract from a very interesting book by Mr George Bird Grinnell:

Years ago, on the sites of abandoned Pawnee villages, on the Loup Fork and on the Platte, fragments of pottery used to be found among the débris of the fallen lodges. The manufacture of this pottery was no doubt abandoned long ago, and has probably not been practiced to any considerable extent since they met the whites.

[a] Hunter, John D., Memoirs of a captivity among the Indians, London, 1823, pp. 288–89.

[b] Catlin, George, Letters and notes on the North American Indians, London, 1844, vol. I, p. 116.

A man about fifty years of age stated to me that he had never seen these pots in use, but that his grandmother had told him that in her days they made and used them. He said that they were accustomed to smooth off the end of a tree for a mold. A hot fire was then built, in which stones were roasted, which were afterward pounded into fine powder or sand. This pounded stone they mixed with fine clay, and when the material was of the proper consistency they smeared it over the rounded mold, which was perhaps first well greased with buffalo tallow. After the clay had been made of even thickness throughout, and smooth on the outside, they took a small, sharp stone, and made marks on the outside to ornament it. When the material was sufficiently dry, they lifted it from the mold and burned it in the fire, and while it was baking, "put corn in the pot and stirred it about, and this made it hard as iron." This may mean that it gave the pot a glaze on the inside. In these pots they boiled food of all kinds. Mr Dunbar informs me that these pots were also made in later times within a frame-work of willow twigs. The clay, made very stiff, was smeared on this frame, the inside being repeatedly smoothed with the moistened hand, and but little attention being given to the appearance of the outside. After they had been sun-dried, such pots were baked without removing the frame, which burned away in the fire, leaving the marks of the twigs visible on the outside of the pot.[a]

The following extracts from the writings of Peter Kalm refer to the practice of this art in the eastern portions of the country, and indicate that the art of clay vessel-making was entirely abandoned in those sections familiar to that author more than a century ago. The specimens exhibited by Mr Bartram probably came from the South. Mr Kalm wrote:

Mr Bartram shewed me an earthen pot, which had been found in a place where the Indians formerly lived. He who first dug it out kept grease and fat in it to smear his shoes, boots, and all sorts of leather with. Mr Bartram bought the pot of that man; it was yet entire and not damaged. I could perceive no glaze or color upon it, but on the outside it was very much ornamented and upon the whole well made. Mr Bartram shewed me several pieces of broken earthen vessels which the Indians formerly made use of. It plainly appeared in all these that they were not made of mere clay, but that different materials had been mixed with it, according to the nature of the places where they were made. Those Indians, for example, who lived near the seashore pounded the shells of snails and mussels and mixed them with the clay. Others, who lived farther up in the country where mountain crystals could be found, pounded them and mixed them with their clay; but how they proceeded in making the vessels is entirely unknown. It was plain that they did not burn them much, for they are so soft they might be cut in pieces with a knife; the workmanship, however, seems to have been very good, for at present they find whole vessels or pieces in the ground which are not damaged at all, though they have lain in the ground above a century. Before the Europeans settled in North America the Indians had no other vessels to boil their meat in than these earthen pots of their own making, but since their arrival they have always bought pots, kettles, and other necessary vessels of the Europeans, and take no longer the pains of making some, by which means this art is entirely lost among them. Such vessels of their own construction are therefore a great rarity even among the Indians. I have seen such old pots and pieces of them, consisting of a kind of Serpentine stone, or Linnæus's Talcum, Syst. Nat. 3, p. 52.[b]

[a] Grinnell, George Bird, Pawnee hero stories and folk-tales, New York, 1893, pp. 255–56.
[b] Kalm, Peter, Travels into North America, vol. I, Warrington, 1770, pp 227–29.

In the following extract the author appears to refer to the use of pottery in New Jersey; and sherds now found in so many localities no doubt represent the art of the time referred to.

> The old boilers or kettles of the Indians, were either made of clay, or of different kinds of pot stone (Lapis ollaris). The former consisted of a dark clay, mixt with grains of white sand or quartz, and burnt in the fire. Many of these kettles have two holes in the upper margin, on each side one, through which the Indians put a stick and held the kettle over the fire as long as it was to boil. Most of the kettles have no feet. It is remarkable that no pots of this kind have been found glazed, either on the outside or the inside. A few of the oldest Swedes could yet remember seeing the Indians boil their meat in these pots."

Many details of clay manipulation are given in subsequent pages as the various groups of ware are presented.

SIZE

The production of a vessel of clay required much skill, experience, and foresight; it was not a single, simple act of construction that was necessary, but a series of progressive operations of a delicate and difficult nature, extending over a number of days. These difficulties were much increased with the increase in dimensions of the utensil. A vessel so small as to be kept well within the grasp of the fingers could be built at once, and without great danger of failure at any stage of the work, but in building a large vessel the walls had to be carried upward by degrees, time being required to allow the plastic paste to set and thus to become capable of supporting additional weight. The danger of failure in subsequent stages of the work also increased with the size, and a vessel of clay two or more feet in diameter, and three-fourths that height, carried successfully through all the steps of modeling, drying, burning, coloring, and ornamentation may well be regarded as a triumph of barbarian manipulative skill.

The average Indian vase, as seen in our museums, is rather small, having a capacity of a gallon or less, but these surviving vessels do not fairly represent the dimensions of the original products; large vessels are rarely preserved for the reason that as a rule, save in limited districts, they were not buried with the dead, as were the smaller pieces.

The use for which the vessel was intended had much to do with its size. The boiling of messes for feasts where many people were to be served required large pots, as did also storage, and evaporation of water for salt or sugar. The so-called salt pots found in Tennessee, Illinois, and Missouri are among the largest vessels known in any section of the country, and fragments have been found indicating a a diameter of three feet or more. In such vessels the depth usually is not great; indeed, few vessels of any class have been collected having a height greater than twenty-four inches. The thickness of the walls of

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"Kalm, Peter. Travels into North America, vol. II, London, 1770, pp. 41–42.

these large vessels, in many cases, reaches or exceeds three-fourths of an inch, and their weight must have been considerable. The potter undoubtedly found it a difficult task to handle them while the clay was still in a plastic or semisolid state.

As a rule the walls of ordinary vases are surprisingly thin, and we are led to admire the skill of the potter who could execute vessels of large size and fine proportions with walls at no point exceeding three-eighths of an inch in thickness. Size varies from the extreme proportions above mentioned to those of toy vessels not more than an inch in diameter and height.

FORMS

The absence of all suggestiveness of form in the natural clay, together with its plasticity when moist, and its brittleness when dry, must have prevented its early independent use in the shaping arts; but when the means of hardening it by baking, and strengthening it by tempering, came to be understood, a new and ever-expanding field was opened to art.

With primitive peoples the first known use of baked clay is in the construction of vessels. The development of form in vessel making is governed by numerous influences and conditions; first, there are functional influences or requirements; second, inherited suggestions and limitations; third, mechanical agencies; fourth, ideographic requirements; and fifth, esthetic forces.

1. Function is of necessity the leading influence in all that pertains to the selection of models and the determination of size and general contour. Primarily the vessel was intended to contain that which unrestrained would be difficult to hold, handle, and transport, and its shape had to be such as would permit the successful performance of these functions. As uses differentiated and multiplied, the various primal forms underwent many changes. The manner of use also led in many cases to special modifications of shape. A pot to be placed upon the fire differed in base and rim from one that was to be suspended; a vase intended to stand upright on a hard floor was different in shape from the one that was to be set upright in the sand.

2. The duties to which earthen vessels were assigned were originally performed by other classes of vessels, and when a new material, wholly amorphous and offering no suggestions of form, came into use, shapes were copied from antecedent vessels, as men, in constructing, necessarily follow suggestions offered by what already exists. Clay vessels, therefore, took forms depending much on the vessels with which the potter was acquainted, and the potters of different nations having unlike models produced different forms from the very start. These inceptive characteristics were long retained and exercised a lasting influence. No race in the world appears to have made as much use of

natural forms in the art at a corresponding grade of culture as the American Indian, and the striking result is seen at a glance, when any large number of vessels made by the more advanced tribes is brought together.

3. In the use of any material in the shaping arts certain processes and certain mechanical aids are employed, and these vary with the materials and with the acquirements of the potter so that great variation of form results. Clay has limitations of strength unburned and burned, and form is governed by these limitations. If the potter is unskilled of hand and eye, his work will lack in symmetry and grace; and if his appliances are imperfect, its form will as a consequence be unsymmetric and rude. The introduction of each improved device leads to modifications of form. It is readily seen, for example, that the discovery of the wheel must have led to the introduction of many new features of form, consigning many others to oblivion.

4. Ideographic influences are felt but little in early stages of the art, yet in time they become a powerful force in giving shape to articles of clay. If, for example, a vessel is intended for use in connection with rites relating to a particular animal deity, the shape is made to suggest the form of that deity. The idea in such cases governs not only the shape but the color and decoration.

5. Esthetic influence is necessarily weak during the earliest practice of the art, and shape is apparently slow to receive esthetic notice and modification; but, even at this stage, use, model, and technic give much that is regarded as pleasing in form. Certain proportions and something of grace are necessarily embodied in each vessel and it is quite impossible in a given case to determine at just what point the esthetic idea begins to produce its effects. In even the most primitive groups of earthenware there are apparent traces of the action of this force in the modification of margins and in the turning of curves.

The forms produced in the primitive stages of the art are, as a rule, exceedingly simple. We may assume that the most elementary form is the bowl or cup with rounded bottom, wide mouth, and plain margin. There are a number of influences tending to give the base a rounded rather than a flat or concave shape, among which are the available natural forms or models, the manner of use, and the ease and naturalness of construction. Flat and concave bottoms come late, as do also such features as pedestals, annular bases, feet, and legs. These come into use no doubt with the introduction of hard, level floors in the dwelling. As skill increases, the margin of the vessel rises, the outline varies from the globular form, and many causes lead to specialization and elaboration, so that we have oblong and flattened bodies, constricted rims, straight and recurved lips, short and high necks, and many degrees of constriction of opening. Compound and complex forms follow, and finally the potter ventures on the production of natural

forms, representing and portraying shells, fruits, birds, beasts, and men, essaying also many fanciful creations. However, for a long time the fundamental purpose of vessels was that of containing, and the various changes rung on their forms do not seriously interfere with this normal function.

After great skill is acquired in the handling of clay other articles are manufactured, and the ceramic field is greatly enlarged; thus we have implements, pipes, figurines, idols, spindle whorls, musical instruments, and personal ornaments.

COLOR

Color of Paste

The colors observed in primitive earthen vessels are, in a great measure, the result of causes not regulated or foreseen by the potter; the clays employed have different hues, and in the process of baking alterations in color take place through chemical changes or through the deposition of carbonaceous matter on the surfaces. The range of these colors is quite large and varies with materials and processes, but the prevailing colors are dark reddish, yellowish, and brownish grays, often unevenly distributed over the surface of the vessel. Many tribes were not satisfied with the colors produced in this way, but submitted the vessel to special processes to effect desired changes. One method, already referred to and thought to be aboriginal, consisted in covering the vessel with fuel which was burned in such a way as to confine the smoke, thus giving a glossy black finish.

When vessels are broken, it is observed that the color of the paste is not uniform throughout the mass; usually the interior is darker than the surface, which was exposed directly to the heat in baking and lost such portions of its original coloring matter as happened to be most volatile. Possibly this effect may in cases be produced by weathering, or, rather, by the bleaching action of the soil in which the vessels were embedded.

Application of Color

It was a common practice with some tribes to apply a wash of color to the surface of the vase, generally to the more exposed parts of the exterior only. Little is known of the manner in which the colors were mixed and used. They were usually applied before the baking, and were always polished down with a rubbing stone. Red was the favorite color.

Du Pratz mentions the use of color by the Natchez Indians in the following lines:

> On the same hill (White hill) there are veins of ocher, of which the Natchez had just taken some to stain their pottery, which is very pretty; when it was besmeared with ocher it became red after burning.[a]

The preference for particular colors may be due to a number of

[a] Du Pratz, Antoine Simon Le Page, Histoire de la Louisiane, Paris, 1758, vol. I, p. 124.

causes, two of which are of especial importance: first, with some peoples colors had peculiar mythologic significance, and on this account were appropriate to vessels employed for certain ceremonial uses; second, most savage and barbarian peoples have a decided fondness for colors, and appreciate their esthetic values, taste being exercised in their selection. There is good evidence that both superstitious and esthetic motives influenced the potters of the mound region; but it is impossible to say from a study of the vases exactly what part each of these motives took in producing the results observed in the wares studied. Ordinarily domestic pottery did not receive surface coloring, as subsequent use over fire would entirely obliterate it. Coloring for ornament is more fully discussed in a subsequent section (page 66).

DECORATION

Evolution of Decoration

A volume could be written on this most attractive subject, but a brief outline is all that can be given in this place. The origin and early development of the idea of embellishment and the manner in which decorative features came to be introduced into the ceramic art can not be examined in detail. I have dwelt on these topics to some extent in two papers already published, Form and Ornament in the Ceramic Art, Fourth Annual Report of the Bureau of Ethnology, and the Evolution of Ornament, an American Lesson, in the American Anthropologist, April 1890. It is not essential to the purpose of this paper that I should here do more than characterize and classify the native decorative work of the eastern United States in a somewhat general way, detailed studies being presented in connection with the separate presentation of ceramic groups.

Decoration may be studied, first, with reference to the subject-matter of the ornamentation—its form, origin, and significance—and, second, with reference to the methods of execution and the devices and implements employed. It may also be examined with reference to such evidence as it affords regarding racial and tribal history.

The subject-matter of primitive ceramic ornament, the elements or motives employed, may be assigned to two great classes based on the character of the conceptions associated with them. These are non-ideographic, that is to say, those having a purely esthetic office, and those having in addition to this function associated ideas of a superstitious, mnemonic, or other significant nature. Nonideographic elements are mainly derived from two sources: first, by copying from objects having decorative features, natural or artificial, and second, from suggestions of a decorative nature arising within the art from constructive and manipulative features. Natural objects, such as seashells and fruit shells, abound in features highly suggestive of embellishment, and these objects are constantly and intimately associated with the plastic art and are copied by the potter. Artificial objects

have two classes of features capable of giving rise to ornament; these are constructional and functional. Those of the former class are represented by such features as the coil employed in building, and the stitch, the plait, and the twist employed in textile fabrics. Those of the latter are represented by handles, legs, bands, perforations, etc. Suggestions incidental to manufacture, such as finger markings, imprints of implements, and markings of molds, are fruitful sources of nonideographic decorations.

In the primitive stages of the art simple nonideographic elements seem to predominate, but it is difficult to draw a line separating them from the ideographic, for an idea may at any time become associated with even the most elementary design. When, however, we encounter delineative elements or subjects employed in ornamental offices, we may reasonably assume that ideas were associated with them, that they were symbolic. It is pretty generally conceded that life forms were not employed in early art save when they had a peculiar significance and applicability in the connection in which they were used, and it is probable that the associated idea was often retained even though the representation became so conventionalized and formal that the ordinary observer would no longer recognize the semblance of nature. This topic was examined in detail in a recent study of the art of ancient Chiriqui,[a] and is presented in equally definite form in the section of this paper devoted to Gulf Coast ware.

The range of imitative subjects employed in surface decoration is not large. Within the whole area studied, no representation of a plant has been found; birds and the human figure were rarely delineated, and even quadrupeds, so generally employed in modeling, do not appear with frequency in other forms of expression. Ceramic decoration is probably late in taking up the graphic and ideographic art of a people. This conservatism may be due to the fact that in early stages the art is purely domestic, and such delineations would have little appropriateness. It is probably not until the fictile products come to take a prominent place in superstitious usages that significant designs are demanded and employed.

Methods of Decorating

The decoration of earthenware was accomplished in a number of ways which are classified by form characters as relieved, flat, and depressed. The processes employed are modeling with the fingers and with tools, molding in baskets or other vessels having ornamented surfaces, and stamping, paddling, impressing, puncturing, carving, incising, polishing, and painting with such tools as were most convenient. A brief review of the decorating processes has already been given under the head Manufacture.

[a] Holmes, W. H., Ancient art of the province of Chiriqui, in Sixth Annual Report of the Bureau of Ethnology, Washington, 1888.

RELIEVED ORNAMENT

The modeling of animal forms constituted a prominent feature of the potter's art in the Mississippi valley as well as in some other sections. As a rule the figures were modeled, in part at least, in the round, and were attached to or formed essential parts of the vase. Usually, no doubt, they had a symbolic office, but their decorative value was not lost sight of, and the forms graded imperceptibly into conventional relieved features that to all appearances were purely decorative.

Decorative designs of a purely conventional character were often executed in both low and salient relief. This was generally accomplished by the addition of nodes and fillets of clay to the plain surfaces of the vessel. Fillets were applied in various ways over the body, forming horizontal, oblique, and vertical bands or ribs. When placed about the rim or neck, these fillets were often indented with the finger or an implement so as to imitate, rudely, a heavy twisted cord—a feature evidently borrowed from basketry or copied from cords used in mending or handling earthen vessels. Nodes were also attached in various ways to the neck and body of the vessel, sometimes covering it as with spines. In some cases the entire surface of the larger vessels was varied by pinching up small bits of clay between the nails of the fingers and the thumb. An implement was sometimes used to produce a similar result.

INTAGLIO ORNAMENT

The esthetic tendencies of the potters are well shown by their essays in engraving. They worked with points on both the plastic and the sun-dried clay, and possibly at times on the fire-baked surface. Figures thus produced exhibit a wide range of artistic achievement. They illustrate all stages of progress from the most archaic type of ornament—the use of loosely associated dots and straight lines—to the most elegant combinations of curves, and the delineation of life forms and fanciful conceptions.

In many cases when a blunt implement was employed, the line was produced by a trailing movement. The result is quite distinct from that of incision, in which a sharp point is used, and excision or excavation which is more easily accomplished with the end of a hollow reed or bone. The application of textile fabrics giving impressions of the mesh was very general, and engraved paddles were used to give similar effects. These topics are treated at length elsewhere in this paper. Repoussé work, which consisted in punching up nodes by applying a blunt tool to the opposite side of the vessel wall, was common in some localities.

PAINTED ORNAMENT

The use of color in decorating earthenware marks a very decided advance beyond the inceptive stage of the art. Vessels to be employed in ordinary culinary work needed no surface ornament, and could not retain it during use. When differentiation of use had made some prog-

ress, and neat appearance became desirable, coloring was applied, and when the office became ceremonial or superstitious, elaborate designs were employed. Ornament in color is common in the middle and lower Mississippi regions, and is seen to some extent along the Gulf coast and in Florida; rare examples have been found in the middle Ohio region and east of the Appalachian high land in Georgia and the Carolinas. The most decided prevalence of color in finish and decoration is discovered in the Arkansas region, from which locality as a center this feature is found to fade out and gradually disappear. The reason of this is not determined, but it is to be remarked that Arkansas borders somewhat closely on the Pueblo country where the use of color was general, and this idea, as has already been remarked, may have been borrowed from the ancient Pueblo potter.

The colors used in painting were white, red, brown, and black; they consisted for the most part of finely pulverized clay mixed with ochers and of native ochers alone. Occasionally the colors used seem to have been mere stains. All were probably laid on with coarse brushes of hair, feathers, or vegetal fiber. The figures in most cases are simple, but are applied in a broad, bold way, indicative of a well-advanced stage of decorative art. Skill had not yet reached the point, however, at which ideographic pictorial subjects could be presented with much freedom, and the work was for the most part purely conventional. As would be expected, curvilinear forms prevail as a result of the free-hand method of execution; they embrace meanders, scrolls, circles, spirals, and combinations and grouping of curved lines. Of rectilinear forms, lozenges, guilloches, zigzags, checkers, crosses, and stellar shapes are best known. Many of these figures were doubtless symbolic. Life forms were seldom attempted, although modeled figures of animals were sometimes given appropriate markings, as in the case of a fine owl-shaped vessel from Arkansas, and of a quadruped vase, with striped and spotted body, from Missouri. Examples of human figures from Arkansas have the costume delineated in some detail in red, white, and the ochery color of the paste, and numerous vases shaped in imitation of the human head have the skin, hair, and ornaments colored approximately to life.

In some cases the patterns on vases are brought out by polishing certain areas more highly than others, and an example is cited by C. C. Jones in which inlaying had been resorted to.[a]

USE OF TEXTILES IN MODELING AND EMBELLISHING

Relation of the Textile and Ceramic Arts

Among the tribes of a wide zone in southern British America and northern United States, and extending from the Atlantic to the Rocky mountains, the ceramic art was intimately associated with the textile art,

[a] Jones, C. C., Antiquities of the southern Indians, p. 159.

and the earthenware exhibits traces of this intimacy as one of its most constant characteristics. These traces consist of impressions of textile articles made on the plastic clay during manufacture, and of markings in imitation of textile characters traced or stamped on the newly made vessels. The textile art is no doubt the older art in this region as elsewhere, and the potter, working always with textile appliances and with textile models before him, has borrowed many elements of form and ornament from them. Textile forms and markings are thus in this part of America a characteristic of the initial stages of the ceramic art.

It is true that we can not say in any case whether the potter's art as practiced in the northern districts is exclusively of local development, springing from suggestions offered by the practice of simple culinary arts, especially basketry, or whether it represents degenerate phases of southern art radiating from far away culture centers and reduced to the utmost simplicity by the unfriendly environment. We are certainly safe, however, in assuming that this peculiar phase of the art represents its initial stage—a stage through and from which arose the higher and more complex phases characterizing succeeding stages of barbarism and civilization.

Whether with all peoples the art passed through the textile stage may remain a question, because the traces are obliterated by lapse of time, but we observe as we pass south through the United States that the textile-marked ware becomes less and less prevalent. However, sufficient traces of textile finish are still found in Florida and other Gulf states to suggest a former practice there of the archaic art.

Classes of Textile Markings

Textile markings found on pottery are of five classes: first, impressions from the surface of rigid forms, such as baskets; second, impressions of fabrics of a pliable nature, such as cloths and nets; third, impressions from woven textures used over the hand or over some suitable modeling implement; fourth, impressions of cords wrapped about modeling paddles or rocking tools; fifth, impressions of bits of cords or other textile units, singly or in groups, applied for ornament only and so arranged as to give textile-like patterns. In addition, we have a large class of impressions and markings in which textile effects are mechanically imitated.

The several kinds of textile markings are not equally distributed over the country, but each, to a certain extent, seems to characterize the wares of a particular region or to belong to particular groups of ware, indicating, perhaps, the condition and practices of distinct peoples or variations in initial elements affecting the art. There may also be a certain order in the development of the various classes of impressions—a passing from simple to complex phenomena, from the purely mechanical or the simply imitative to the conventionally modified and highly elaborated phases of embellishment.

Use of Baskets in Molding and Modeling

The extent to which baskets were used in modeling pottery in this great province has been greatly overestimated. Instead of being the rule, as we have been led to believe, their use constitutes the exception, and the rare exception.



Fig. 31—Use of a basket in modeling an earthen vessel (Pueblo Indians, Cushing, in the Fourth Annual Report of the Bureau of Ethnology).

The functions of the fabrics and textile elements used in connection with the manufacture of pottery deserve careful consideration. There can be little doubt that these functions are both practical and esthetic, but we shall not be able to make the distinction in all cases. Practical uses may be of several kinds. In modeling a clay vessel a basket may be used as a support and pivot, thus becoming an incipient form of the wheel (see figure 31). It may equally well assist in shaping the bodies of the vessels, thus assuming in a limited way the functions of a mold (see figure 32). The mat on which a plastic vessel happens to rest leaves impressions rendered indelible by subsequent firing. The same may be true of any fabric brought into contact with the plastic surface, but the impressions in such cases are accidental and have no practical function.

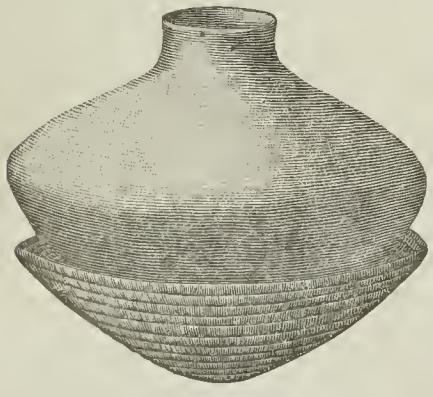


Fig. 32—Use of a basket as a mold for the base of an earthen vessel (Pueblo Indians, Cushing, work cited).

That baskets were used in the East as molds is attested by historical evidence, as may be seen by reference to the citation from Hunter, previously made. I can but regard it as remarkable, however, that in handling thousands of specimens of this pottery I have found no vase the imprints on which fully warrant the statement that a basket was employed as a mold, or even as a support for the incipient clay form. Many assertions to the contrary have been made, probably through misapprehension of the nature of the



FIG. 33—Vase showing impressions resulting from the use of pliable fabrics in wrapping and sustaining the vessel while plastic. Height 4 inches.



a *b*

FIG. 34—Fragment of salt vessel, with cast in clay, showing kind of fabric used in modeling vessels. About one-half actual size.

markings observed. On fragments of imperfectly preserved vessels distinctions can not readily be drawn between disconnected impressions made by the partial application of pliable fabrics or textile-covered stamps and the systematically connected imprintings made by the surface of a basket. The unwary are likely even to mistake the rude patterns made by impressing bits of cords in geometric arrangement about the rims of vases for the imprints of baskets.

Use of Pliable Fabrics in Modeling

Pliable fabrics, such as sacks, nets, and cloth, were made use of as exterior supports in holding or handling the vessel while it was still in a plastic condition. Mr Mooney says that the Cherokees use a rag to lift the pot at one stage in its manufacture, and it is easy to see that cloths or nets wrapped about the exterior surface of the plastic walls would serve to prevent quick drying and consequent cracking of

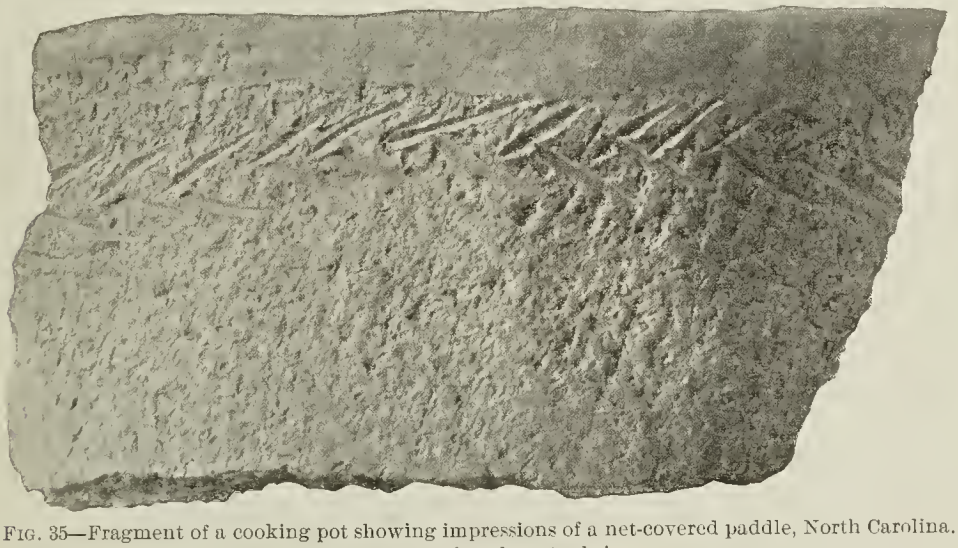


FIG. 35—Fragment of a cooking pot showing impressions of a net-covered paddle, North Carolina. About three-fourths actual size.

the clay along a weak line. Binding up with cloths or nets would interfere with the deforming tendency of pressure during the modeling process and of sinking from weight of the plastic walls. Mr Sellers, a very acute observer, believed that the modeling of certain large salt basins was done on core-like molds of clay. In such a case, or where, as observed by Hunter, blocks of wood were used, the cloth would serve an important purpose in facilitating the removal of the plastic or partly dried clay shell and in supporting it during subsequent stages of the shaping and finishing processes. Such removal would probably be accomplished by turning the mold, with the vase upon it, upside down, and allowing the latter to fall off into the fabric by its own weight or by the means of pressure from the hands. An excellent example of the impressions made on the surface of vases by fabrics applied in the course of manufacture is shown in figure 33. The



FIG. 36—Bowl from a North Carolina mound, showing impressions of a cord-wrapped malleating tool. Diameter 6 inches.

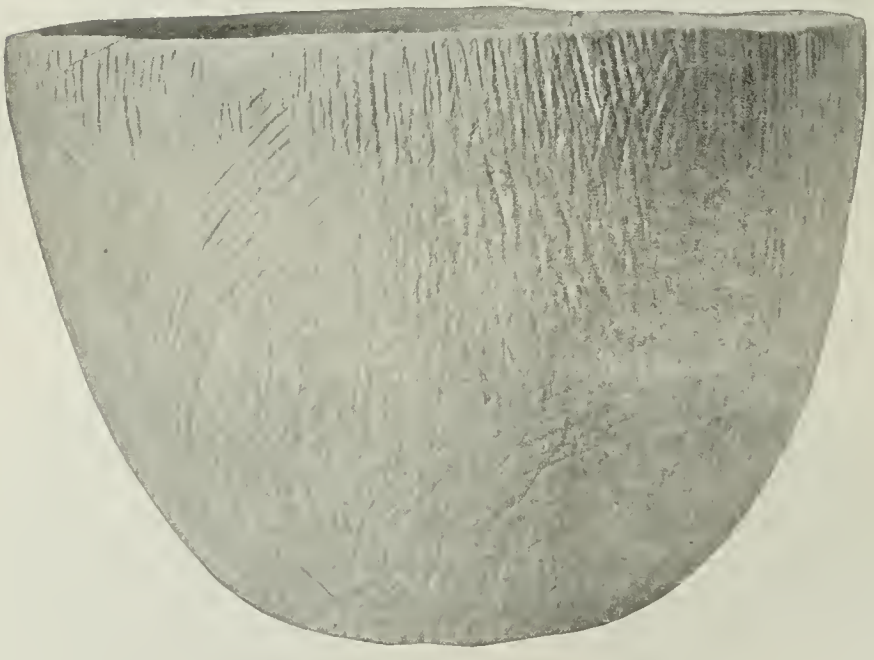


FIG. 37—Bowl made by the author. The surface finished with the cord-wrapped paddle shown in figure 38. Diameter 6 inches.

specimen is a small vessel obtained from a mound in Lenoir county, North Carolina. Figure 34*a* illustrates an ordinary example of the fabrics used by the makers of salt pans in wrapping the plastic form. The positive restoration, *b*, was obtained by making an impression in clay from the potsherd.

Use of Textiles in Malleating Surfaces

An extended series of experiments, made for the purpose of determining the functions of fabrics in pottery making, has led to the observation that the imprintings were in many cases not made by textiles used as supports, but were applied wrapped about the hand or a modeling tool as a means of knitting or welding together the clay surface. Experiment shows that the deeper and more complex the imprintings, if properly managed, the more tenacious becomes the clay. An example of net-paddled ware is given in figure 35. Scarifying, combing, pinching with the fingernails, or malleating with engraved paddles, served the same purpose.



FIG. 38—Cherokee potter's paddle wrapped with cord and used in malleating the bowl shown in figure 37.

Use of Flat Cord-wrapped Malleating Tools

It was further observed, as a result of these investigations, that more than half of the textile markings on vases are not really imprints of fabrics at all, but are the result of going over the surface with modeling tools covered or wrapped with unwoven twisted cords. This is well illustrated in figures 36 and 37.

Figure 36 illustrates a small bowl from a mound in North Carolina. The surface is completely covered with deep, sharp markings made by paddling with a cord-wrapped tool applied repeatedly and at various angles.

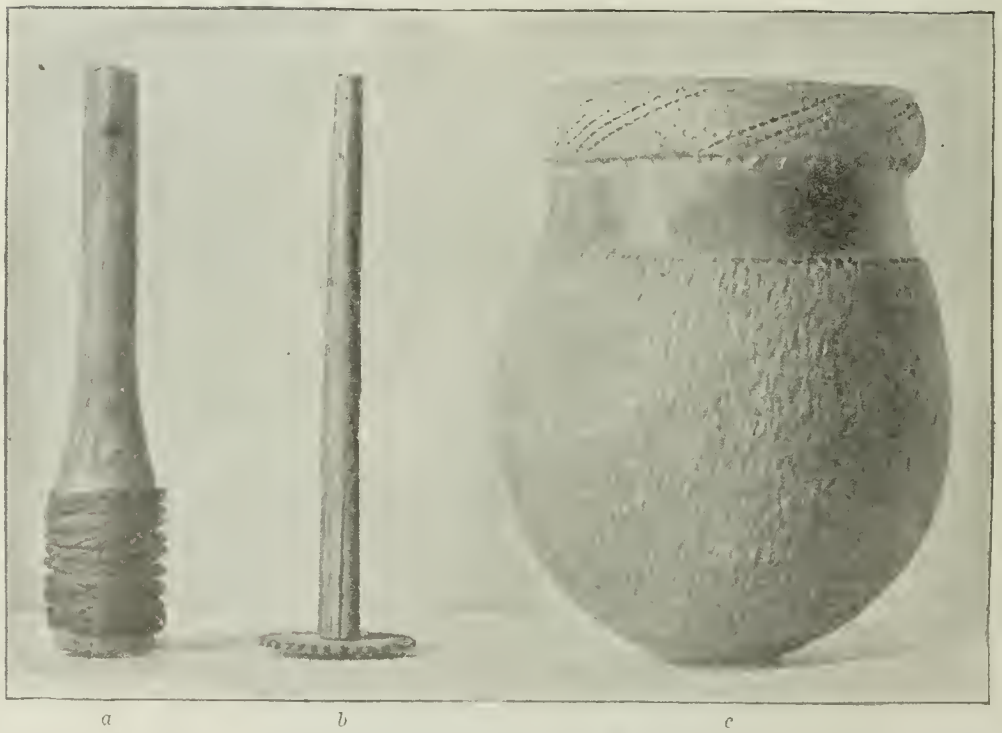
Figure 37 shows a similar cup made of potter's clay as an experiment. The malleating implement was a Cherokee potter's paddle which I had wrapped with native cord (see figure 38).

Use of Cord-wrapped Rocking Tools

Of the same general class as the cord-wrapped paddle were other tools, more or less rounded and wrapped with cord. These may have been applied as paddles, but were usually rocked back and forth, the rounder forms being revolved as a roulette. The impressions of the



FIG. 39—Potsherd showing effect produced by rocking a cord-wrapped implement back and forth. About three-fourths actual size.



a *b* *c*

FIG. 40—*a*, A cylindric modeling tool wrapped with cord (restored); *b*, a notched wheel or roulette (restored); *c*, a vessel made by the author; surface finished with a cord-wrapped implement and decorated with the roulette. About one-half actual size.

flat paddle are distinguished by the patchy and disconnected nature of the imprints. The rolling or rocking implement was not lifted from the surface, and gave a zigzag connection to the markings, illustrated in figure 39.

The rolling or rocking modeling tools had an advantage over the

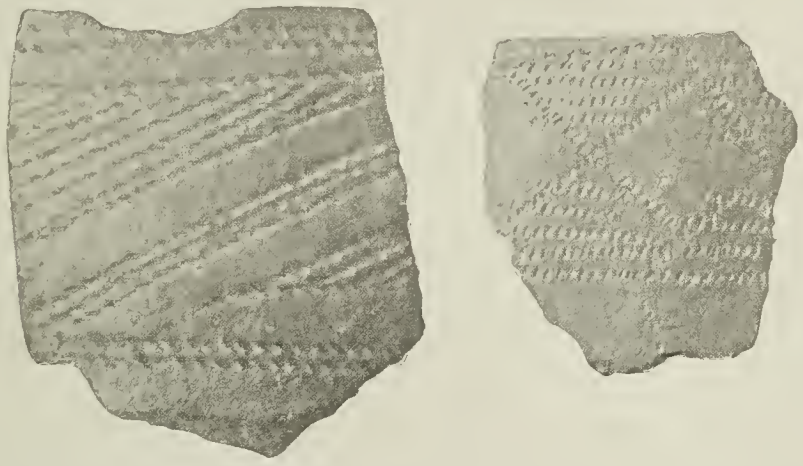


FIG. 41—Potsherds showing simple method of applying cords in decorating vases. About three-fourths actual size.

flat paddles in treating round surfaces, and especially about the constricted neck of the vessel. I have undertaken to restore this implement, as illustrated in figure 40 *a*, and have used it successfully in



FIG. 42—Small pot with finger-nail markings giving the effect of basket impressions. One-third actual size.

imitating effects common in the simpler wares of a vast region (see figure 40 *c*). Implements of this class served the triple purpose: (1) of modeling the surface, reducing irregularities; (2) of kneading and knitting the surface, making the walls stronger; and (3) of imparting a

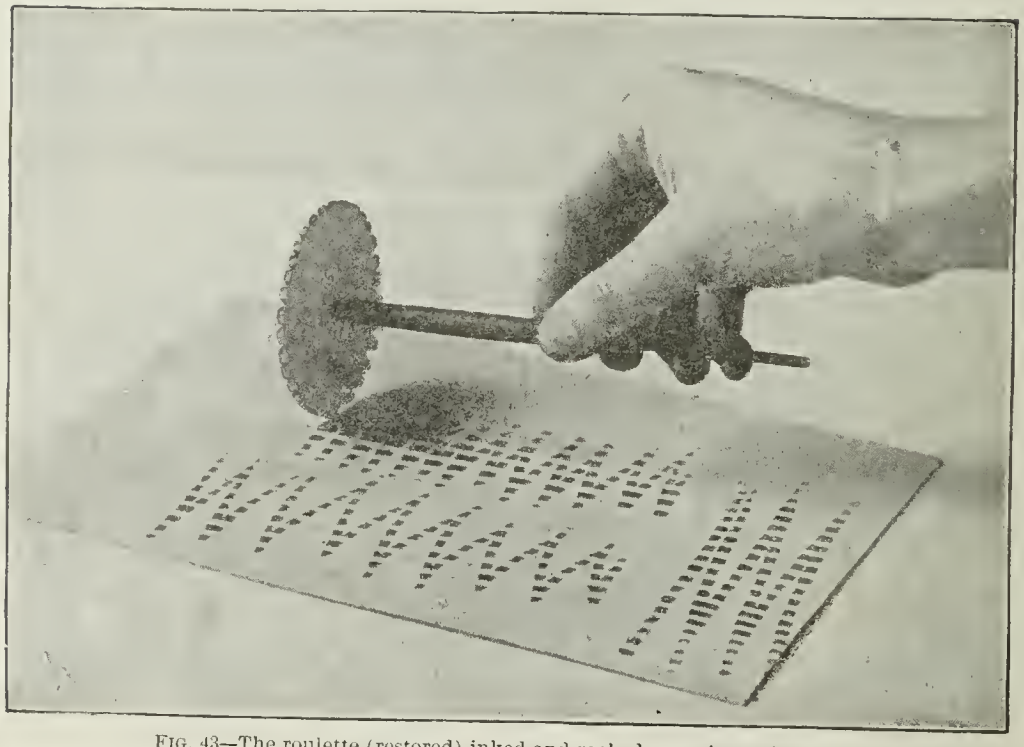


FIG. 43—The roulette (restored) inked and rocked on a sheet of paper.

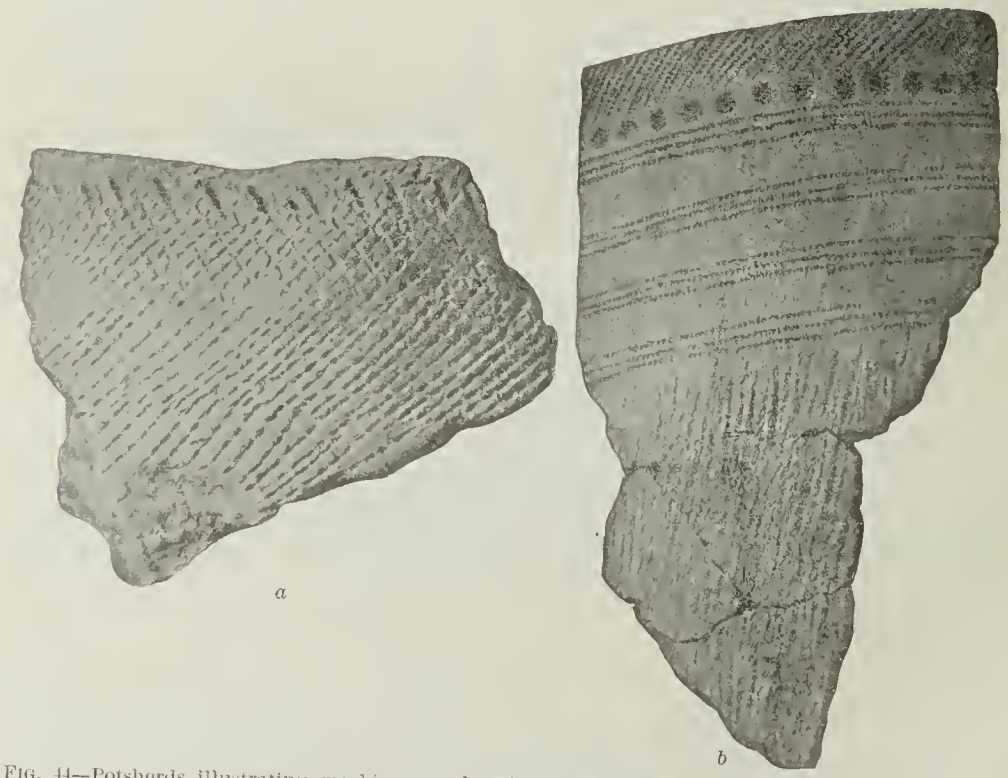


FIG. 44—Potsherds illustrating markings produced by the notched wheel; *a* about three-fourths actual size; *b* about one-third actual size.

texture to the surface that may have been regarded as pleasing to the eye. It is seen, however, that whenever it was desired to add ornamental designs, even of the most simple kind, this cord marking was generally smoothed down over that part of the surface to be treated, so that the figures imprinted or incised would have the advantage of an even ground.

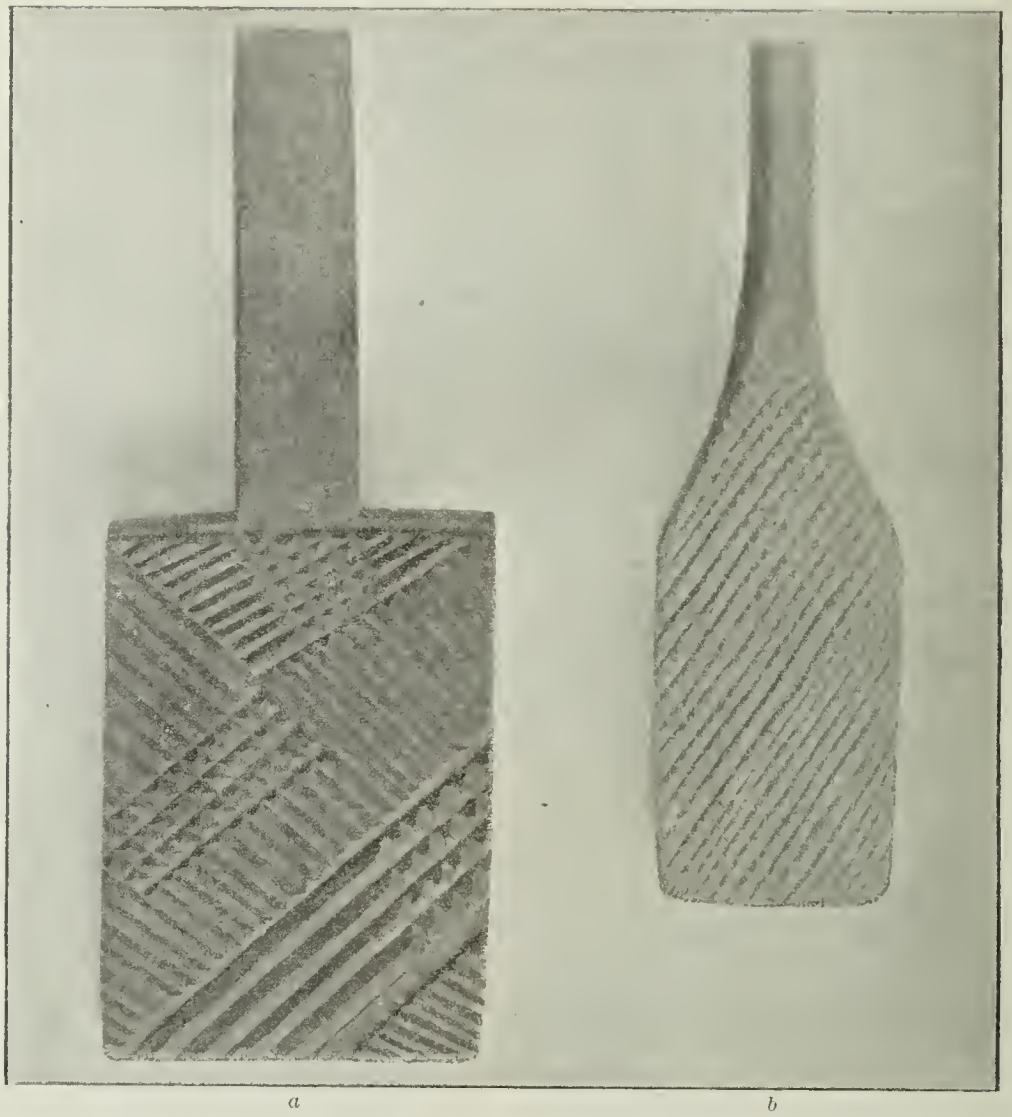
Use of Cords in Imprinting Ornamental Patterns

Growing out of the use of cord-wrapped tools in modeling and finishing the clay surfaces is a group of phenomena of great importance in



Fig. 45—Potsherds with stamped markings giving textile-like effects. One-half actual size.

the history of ceramic ornament. I refer to the imprinting of twisted cords, singly and in such relations and order as to produce ornamental effects or patterns. In its simplest use the cord was laid on and imprinted in a few lines around the shoulder or neck of the vessel. Elaborations of this use are imprintings which produce a great variety of simple geometric patterns, differing with the regions and the peoples. Connected or current fretwork and curved figures were not readily executed by this method, and are never seen. A few examples of cord-imprinted patterns are shown in figure 41. Hard-twisted cords were



a *b*

FIG. 46—Modeling paddles with faces carved to imitate textile patterns. One-haf actual size.

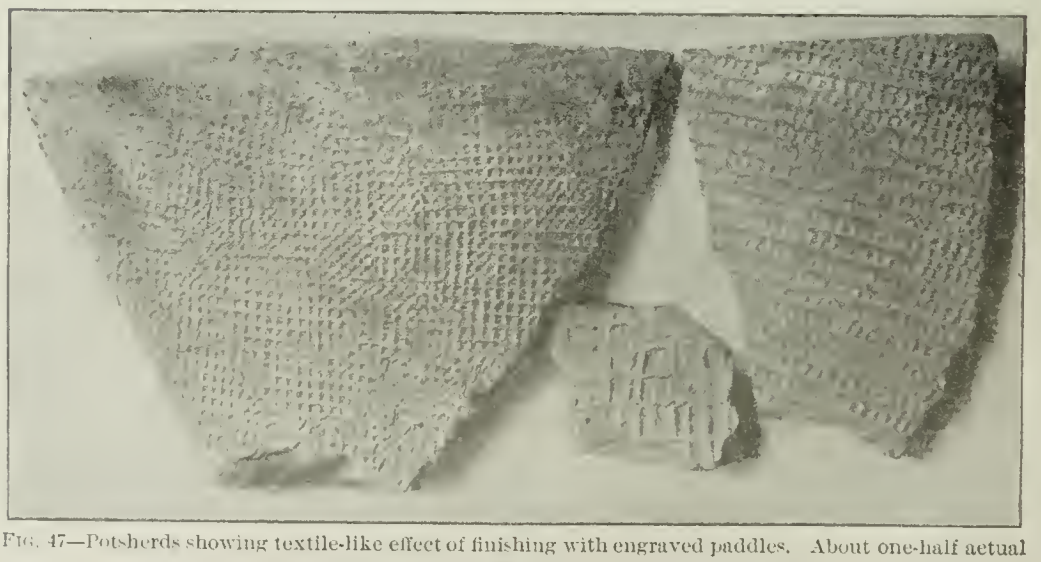


FIG. 47—Potsherds showing textile-like effect of finishing with engraved paddles. About one-half actual size.

in most general use, but their markings were imitated in various ways, as by imprinting strings of beads and slender sticks or sinews wrapped with thread or other unwoven strands.

Various Means of Imitating Textile Characters

It would seem that the textile idea in decoration went beyond the imprinting of textiles and cords, and that textile markings were imitated in many ways, indicating possibly the association of ideas of a special traditional nature with the textile work and their perpetuation in ceramics by the imitation of textile characters. A few of these imitations

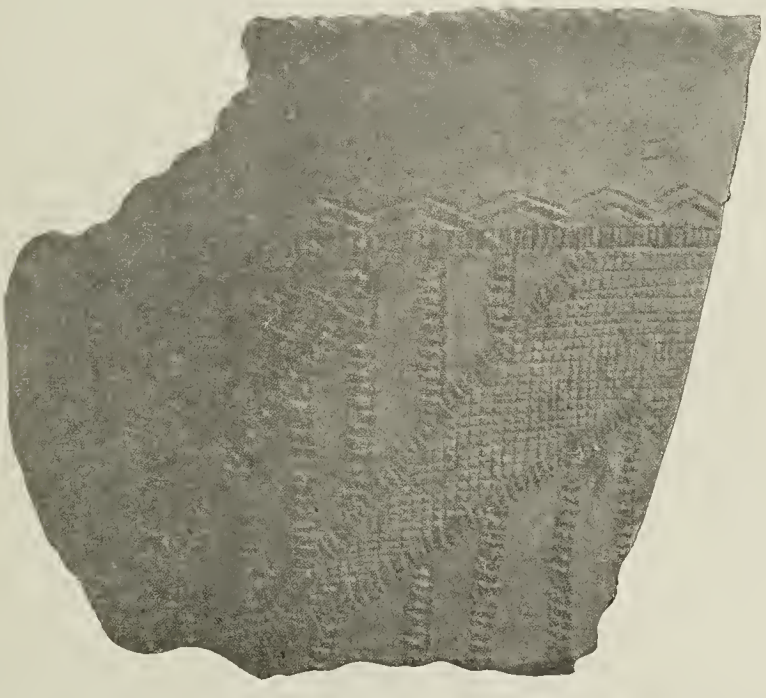


Fig. 48—Incised designs of textile character. About one-half actual size.

may be mentioned. In figure 42 is shown a small pot to which the appearance of a basket has been given by pinching up the plaster surface with the finger nails.

The notched wheel or roulette, restored in figure 40 *b*, was used in imitating cord-made patterns, and this was probably an outgrowth of the use of cord-covered malleating tools. This tool was confined rather closely to one great group of pottery, the so-called roulette-decorated ware of the Northwest. Its effective use is shown in figure 40 *c*, and in illustrations of the ware given in the sections treating of the pottery of the Northwest. The manner of using the implement is well illustrated in figure 43, where an improvised wheel has been inked and rocked back and forth on a sheet of paper. The potsherds shown in figure 44 illustrate these markings as applied by the ancient potters.

Decorative effects closely resembling those produced by the use of cords and the rocking tool were made by narrow, notched stamps applied to the plastic surface in the manner indicated in figure 45. Connecting directly with this simple stamp work, in which a succession of separate imprintings give the textile effects, is the use of the engraved modeling and decorating paddle, so common in the South Appalachian region.

Two Cherokee paddles with engraved surfaces are given in figure 46 *a* and *b*, and the effect of the use of similar implements is shown in figure 47. The sherds illustrated are from Florida mounds.

In figure 48 is presented a bit of ware from a New Jersey village site in which textile-like combinations of lines have been worked out with an incised tool.

Owing to the close association of these ronletted, stamped, and incised effects with the textile-imprinted groups of ware, I feel warranted in speaking of them as in general growing directly out of textile practices, although they are not necessarily always so connected, as the use of the stamp may in cases have arisen from the use of non-textile tools in modeling

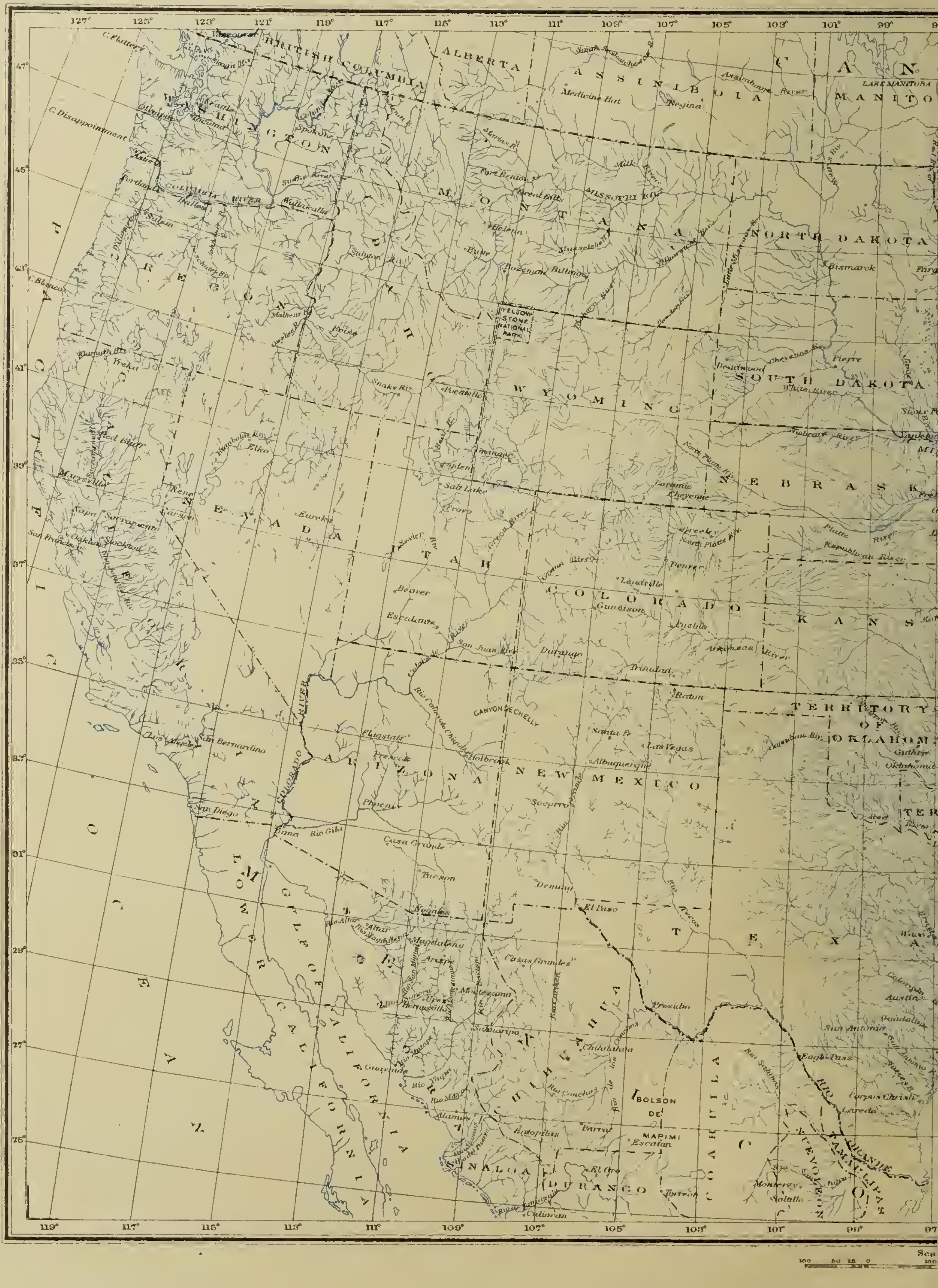
It is thus seen from what has been said that the textile art has served in various ways to shape and modify the ceramic art, and the textile technic has bequeathed its geometric characters to the younger art, giving rise to most varied forms of embellishment, and no doubt profoundly affecting the later phases of its development.

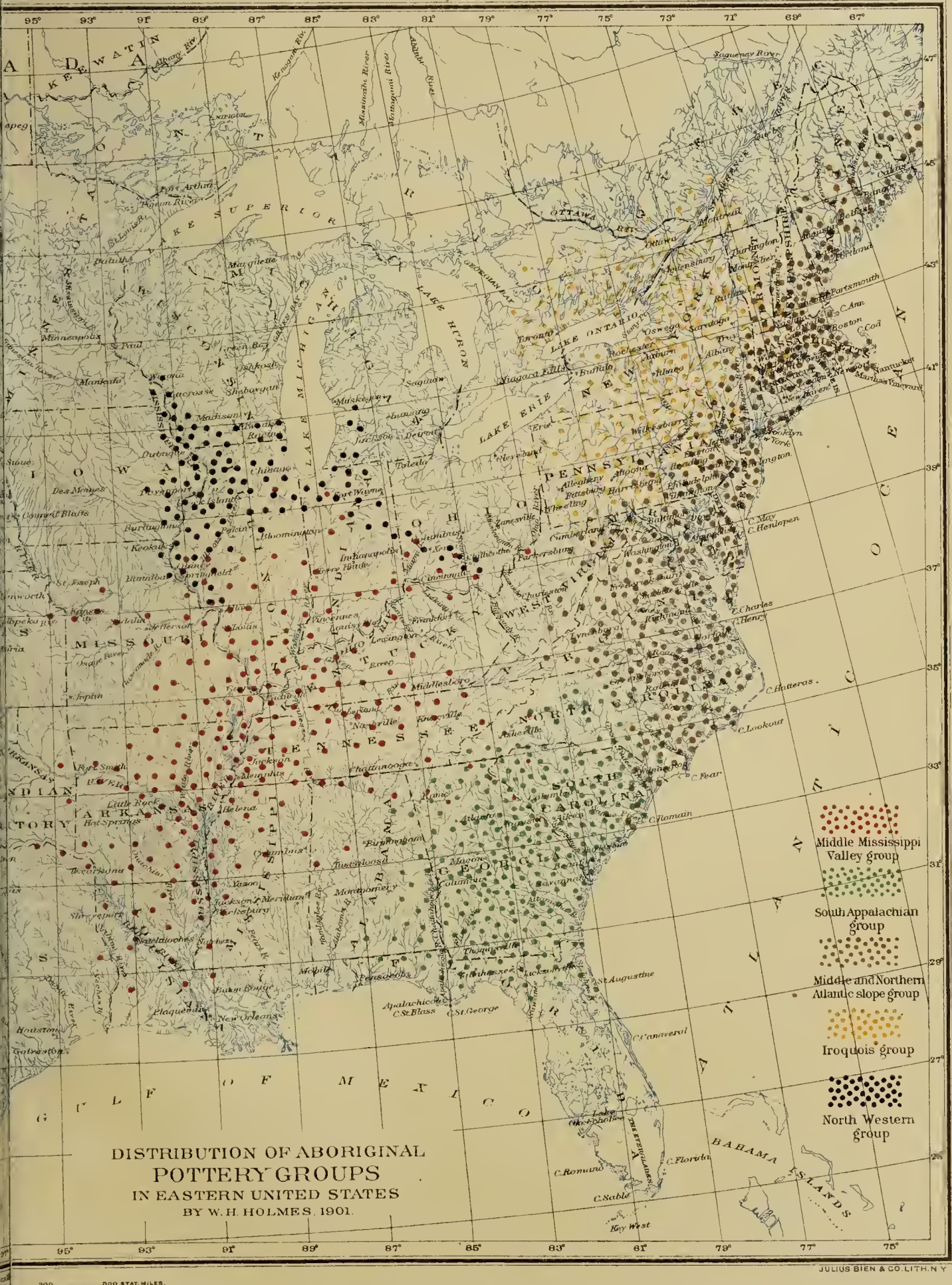
POTTERY OF THE MIDDLE MISSISSIPPI VALLEY

In presenting a review of the several groups or varieties of earthenware it seems advisable to begin with that group most fully represented in our collections, as it will exhibit the widest range of those features and phenomena with which we must in all cases deal. By far the most complete in every essential is the great group of utensils representing the middle Mississippi valley region. The descriptions and illustrations of this group will serve as a basis of comparison in presenting all other groups, thus greatly facilitating and abbreviating the work.

Geographic Distribution

The geographic distribution of the ware of this group naturally receives first consideration. Apparently its greatest and most striking development centers about the contiguous portions of Arkansas, Missouri, Illinois, Kentucky, and Tennessee. The area covered is much greater, however, than would thus be indicated; its borders are extremely irregular, and are not as yet at all clearly defined. Typical specimens are found as far north as Chicago, as far northeast as


BRITISH COLUMBIA
ALBERTA
ASSINIBOIA
MANITOBA
LAKE MANITOBA
WASHINGTON
OREGON
IDAHO
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
NEVADA
UTAH
COLORADO
KANSAS
CALIFORNIA
ARIZONA
NEW MEXICO
TERRITORY OF OKLAHOMA
TEXAS
CHIHUAHUA
SINALOA
DURANGO
BOLSON DE MAPIMI
LOWER CALIFORNIA
GULF OF CALIFORNIA
PACIFIC OCEAN
YELLOWSTONE NATIONAL PARK
CANYON DE CHELLY
COLORADO RIVER
COLUMBIA RIVER
MISSOURI RIV.
C. Disappointment
C. Blanco
Medicine Hat
Regina
Bismarck
Pierre
Deadwood
Fort Benton
Great Falls
Helena
Butte
Bozeman
Billings
Salt Lake
Ogden
Provo
Eureka
Elko
Reno
Carson
Sacramento
San Francisco
Oakland
Stockton
Marysville
Red Bluff
Yreka
Salem
Dalles
Walla Walla
Spokane
Pocatello
Laramie
Cheyenne
Greeley
Denver
Leadville
Gunnison
Pueblo
Trinidad
Durango
Raton
Santa Fe
Las Vegas
Albuquerque
Socorro
Holbrook
Flagstaff
Prescott
Phoenix
Yuma
Rio Gila
Casa Grande
Tucson
Deming
El Paso
Nogales
Magdalena
Casas Grandes
Presidio
Chihuahua
Hermosillo
Guaymas
Batopilas
Parral
Torreon
Monterey
Saltillo
Laredo
Eagle Pass
San Antonio
Austin
Guthrie
Oklahoma
Los Angeles
San Bernardino
San Diego
Beaver
Escalante
Culiacan



DISTRIBUTION OF ABORIGINAL POTTERY GROUPS IN EASTERN UNITED STATES

BY W. H. HOLMES. 1901.

JULIUS BIEN & CO. LITH. N.Y.

Pittsburg, and as far southeast as Augusta, Georgia. Closely related forms are found also along the Gulf of Mexico, from Tampa bay to the Rio Brazos. As a result of the segregation of the peoples of this vast province into social divisions—each more or less isolated and independent and all essentially sedentary—there are well-marked distinctions in the pottery found, and several subgroups may be recognized. The most pronounced of these are found, one in eastern Arkansas and western Tennessee, one in southeastern Missouri, one in the Cumberland valley, Tennessee, and a fourth in the lower Mississippi region. Others may be distinguished as collections are enlarged.

The pottery of this great group does not occupy exclusively any large area. Varieties of ware whose typical development is in other centers of habitation may be found in many places within its range. As to the occurrence of occasional specimens of this ware in remote localities, it may be remarked that there are many agencies that tend to distribute art products beyond their normal limit. These have been referred to in detail in the introductory pages. The accompanying map, plate IV, will assist in giving a general impression of the distribution and relative prevalence of this ware.

Ethnic Considerations

It is not clearly apparent that a study of the distribution of this pottery will serve any important purpose in the settlement of purely ethnic questions. The matter is worthy of close attention, however, since facts that taken alone serve no definite purpose may supplement testimony acquired through other channels, and thus assist in establishing conclusions of importance with respect to tribal or family history.

It is clear that this ware was not made by one but by many tribes, and even by several linguistic families, and we may fairly assume that the group is regional or environmental rather than tribal or national. It is the product of conditions and limitations prevailing for a long time throughout a vast area of country. As to the modern representatives of the pottery-making peoples, we may very reasonably look to any or all of the tribes found occupying the general region when the whites came—Algonquian, Siouan, Muskhogean, Natchesan, and Caddoan.

With respect to the origin of this particular ceramic group we may surmise that it developed largely from the preceramic art of the region, although we must allow that exotic ideas probably crept in now and then to modify and improve it. That exotic features did migrate by one agency or another from Mexico is amply attested by various elements of form and technic found in the ceramic as well as in other arts.

I have sought by a study of the plastic representations of the human

face and figure to learn something of the physiognomy of the pottery-making peoples, but have sought without success. It is evident that portraiture was rarely, if ever, attempted, and, contrary to what might be expected, few of the greatly varied representations of faces suggest strongly the Indian type of countenance.

Chronology

The pottery of this great province is wonderfully homogeneous in its most essential characteristics, and we are not able to say by its appearance or character that any specimen is older or more primitive than another. Exploration has been too unsystematic to enable us to reach any safe conclusions respecting the comparative age of specimens based on the manner of occurrence or relations to artificial or natural deposits. There can be no reasonable doubt, however, that the manufacture of this ware began many centuries before the advent of the white race; it is equally certain that the art was extensively practiced until quite recent times. The early explorers of the valley witnessed the manufacture, and the processes and the manner of use of the ware are, as we have seen in a preceding section, described by several writers. Notwithstanding the early introduction of metal vessels and other utensils that naturally superseded those of clay, some of the tribes of the province seem to have practiced the art continuously nearly to the present day, and some of the pieces recovered from mounds and graves are thought to suggest European models. It is certain, however, that the art had reached its highest stage without the aid of civilized hands, and in the study of its many interesting features we may feel assured that we are dealing with essentially aboriginal ideas.

Preservation

It is generally admitted that there is no vital ethnic or other distinction between the pottery found in mounds, that found on village sites, and that obtained from ordinary graves or stone cists. The condition of the mortuary ware varies with the quality of the terra cotta, and with the conditions of its inhumation. Considering the porous character of the paste and the great degree of moisture in the soil of the Mississippi valley, the state of preservation of many of the vases is remarkable. In some other sections of the country the pieces of pottery were perforated or broken before their inhumation took place, but such was not the practice in this province. The ware of village sites and middens naturally is largely in fragments, and the plowing of cemetery sites has broken up vast numbers of the mortuary vessels.

State of Culture of Makers

The simple life of these people is indicated by the absence of such ceramic forms as lamps, whistles, bricks, and tiles, and by the rare

occurrence of other articles in common use with many barbaric nations. Clay pipes, so neatly shaped even in neighboring districts, are of very rude character over a large part of this district, as is shown in plate XXXIII, at the end of this section. The reason for this is not plain, since the potters of the middle and lower Mississippi region were in advance of all others in the eastern half of the United States in the manipulation of clay, as a comparative study of form, color, and decoration will amply show. In variety and refinement of form this ware excels perhaps even that of the ancient Pueblos, but in almost every other respect the fictile art of the latter was superior. There is nothing to indicate that the culture of the earlier occupants of the valley differed materially from that existing among the historic tribes of the same area.

USES

It is difficult to determine with precision the functions of the various forms of vessels in this group, or, for that matter, in any group where differentiation is well advanced. Certain varieties of rather plain and often rude vessels show traces of use over fire; these were doubtless for boiling and cooking, and for the manufacture of salt. They are usually recovered from midden sites and are in a fragmentary condition. Particular forms were probably intended for preparing and serving food, for storing, carrying, and containing water, oil, honey, salt, paint, fruit seeds, and all articles pertaining to domestic or ceremonial use. Nearly all the better finished and delicate vases are without marks of rough usage, and there can be little doubt that many of them were devoted to sacerdotal and mortuary uses, and that they were made expressly for these purposes. Vases of refined and unusual shape, carefully finished and ornamented, especially those decorated in color, were certainly not generally intended for ordinary domestic use.

Rarely an unusual shape is found suggesting manufacture for burial purposes, and the larger culinary vessels were at times devoted to the burial of children, and probably, also, to the burial of the bones of adults. The presence in the graves of unbaked vases, or what are believed to be such, and of figurines, miniature image vessels, and death's-head vases is suggestive of special making for mortuary use. Probably no other people north of the valley of Mexico has extended its ceramic field as widely as the southern mound-builders. The manufacture of images, toys, rattles, gaming disks, spool-shaped ear ornaments, labrets, beads, pipes, trowels, modeling tools, etc., indicate the widening range of the art.

MATERIALS AND MANUFACTURE

Materials and manufacture have been discussed in the introduction in such detail that little further need be said here. A few features

distinctive of the group may be noted. It is observed that the paste varies in color from a light yellowish gray to dark grays and browns. The light colors were used in vases to be decorated in color. The paste is never vitreous, but is often well baked, firm, and tenacious. Now and then a specimen is discovered that seems to have been sun-dried only, disintegrating readily in water. It is not unusual to find examples of vessels whose paste is quite porous and of low specific gravity. This may be due partly to the use of combustible tempering matter or to the decay of portions of the pulverized shell tempering. As a rule the vases are of medium or heavy weight, and in some cases the walls are quite thick, especially in the tall bottles.

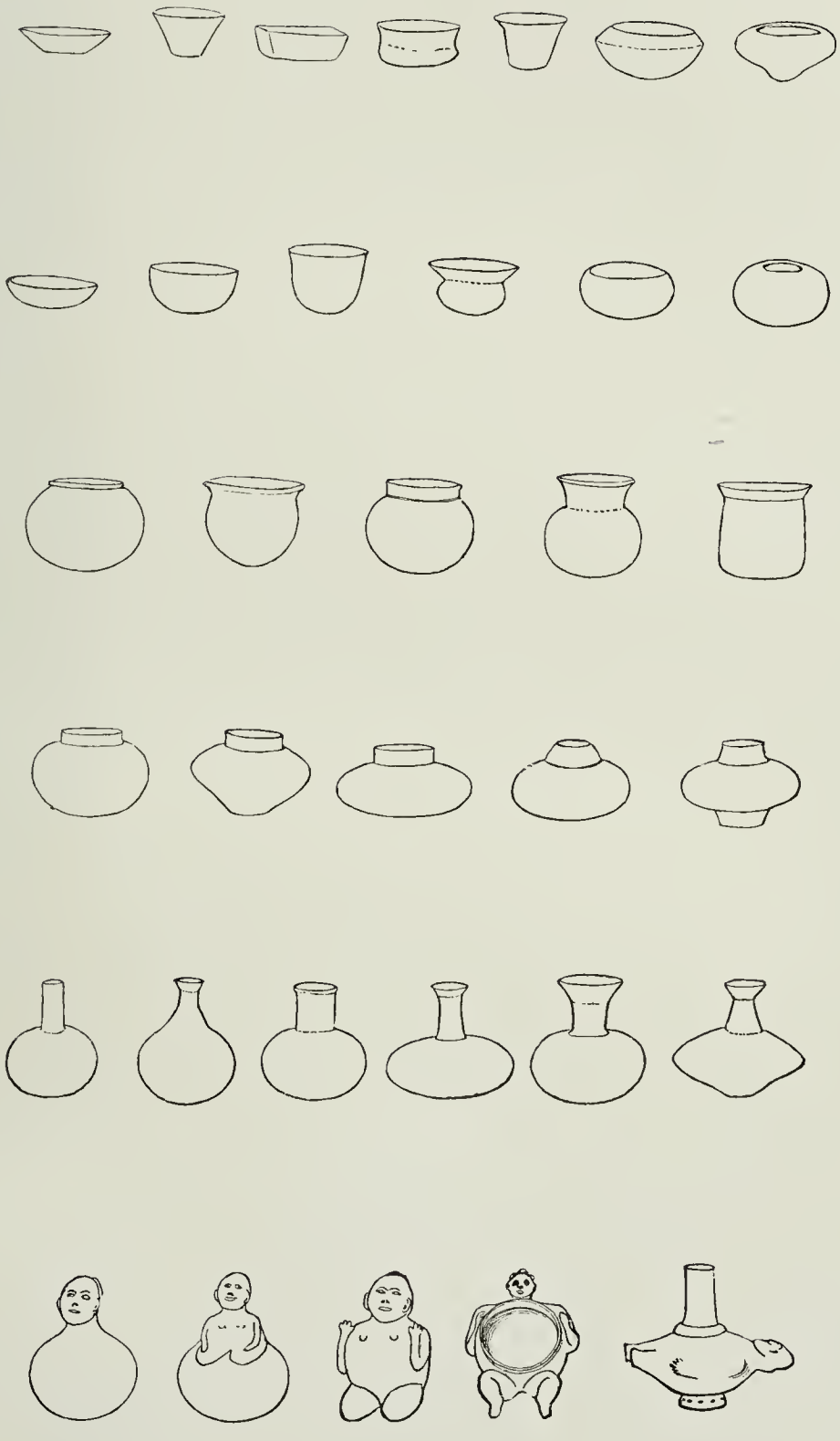
In the better ware tempering materials were finely pulverized or were used in comparatively small quantity. Coarse shell was used in the ruder forms of domestic ware and for the so-called salt vessels. Fragments of shell fully an inch in greatest dimension have been observed in the latter ware. In exceptional cases, especially on the outskirts of the area covered by the group, powdered quartz, mica, and other minerals in large and sharp grains are observed. The paste was manipulated after the fashion already indicated in the introductory pages, and the firing was conducted, no doubt, in the usual primitive ways. Traces of pottery kilns within the district have been reported, but sufficient particulars have not been given to enable us to form a definite notion of their character.

Surface Finish

The finish, as compared with the work of civilized nations, is crude. The surface was often simply hand-smoothed, while in cases it was scarified or roughened by the finger nails or by modeling tools. Generally, however, it was more or less carefully polished by rubbing with an implement of stone, shell, bone, or other suitable material, the markings of these tools being distinctly visible. There is no reason for supposing that glazing was understood, although pieces having partially vitrified surfaces are occasionally found. The surface was often washed with a film of fine light-colored clay, which facilitated the polishing, and in many cases a coat of thick red ocher was applied; this also was polished down. The comparatively rare occurrence of textile finish in the better wares may be due in a measure to the preference for polished or painted surfaces, in producing which original texturings were necessarily obliterated, but it is also probable that these potters had risen above the decidedly primitive textile stage of the art.

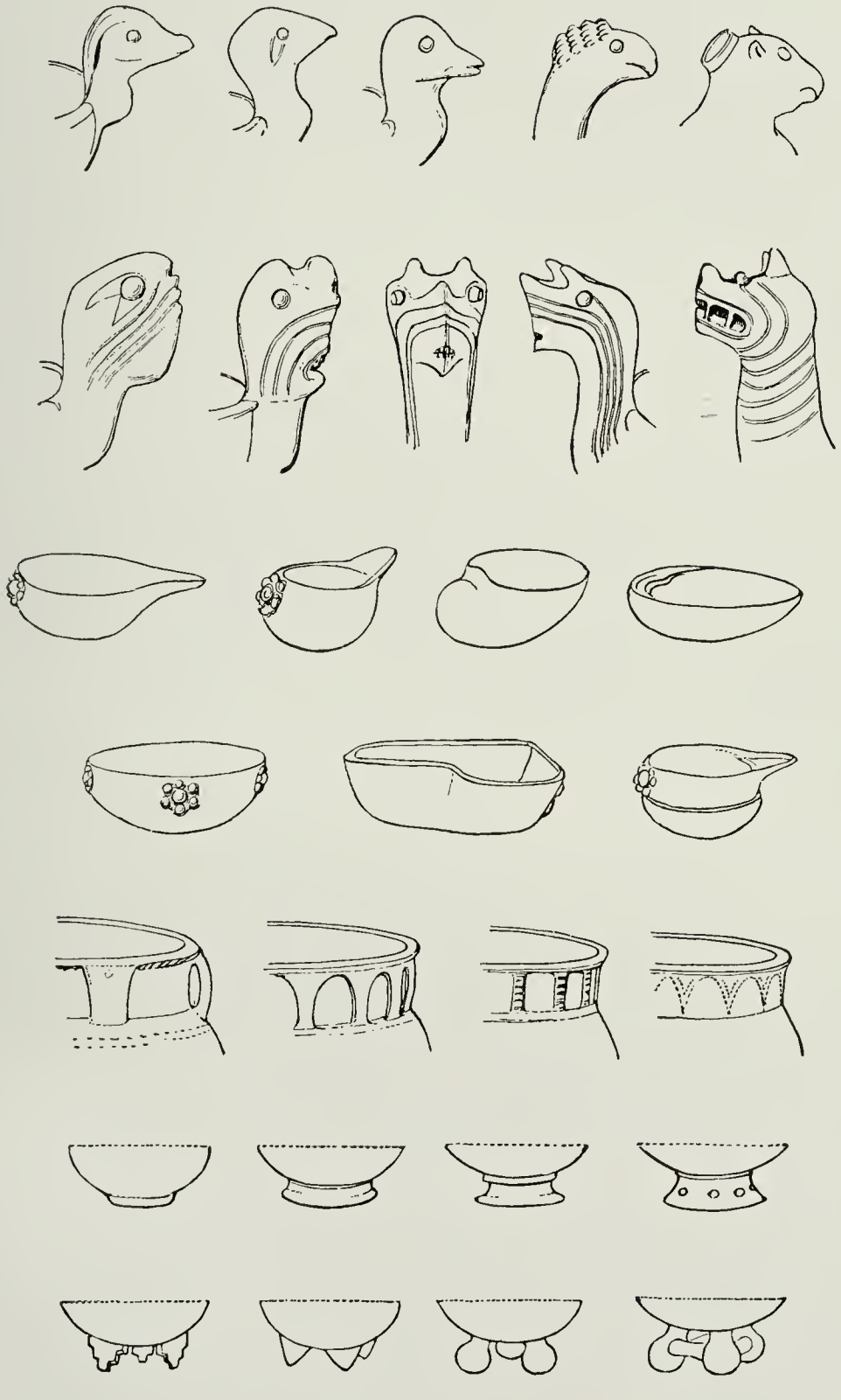
Color

As has been indicated, the paste of this ware presents two marked varieties of color—a dark hue, ranging from a rich black to all shades of brown and gray, and a lighter series of tints comprising warm



SERIES OF OUTLINES INDICATING RANGE OF FORM OF VASES

MIDDLE MISSISSIPPI VALLEY GROUP



SERIES OF OUTLINES SHOWING VARIOUS FEATURES OF VASE ELABORATION

MIDDLE MISSISSIPPI VALLEY GROUP



VASES OF COMPOUND FORM

MIDDLE MISSISSIPPI VALLEY GROUP

ochery grays, rarely approaching the reddish or terra-cotta tones. It is possible that these differences of color were, to some extent, intentionally produced by regulation of the materials or methods of firing. This theory is confirmed by the fact that certain forms of vases are quite generally dark, while other forms are as uniformly light, the latter in nearly all cases having been finished in color or with designs in color.

Form

RANGE

This ware exhibits great variety of outline, many forms being extremely pleasing. In this respect it is far superior to the other groups of the eastern United States. The vessels are perhaps more varied in shape than those of the Pueblo country, but are less diversified and elegant than those of Mexico, Central America, and Peru. They take a higher rank than the prehistoric wares of northern Europe, but, as a matter of course, lack the symmetry and refinement of outline that characterizes the wheel-made pottery of Mediterranean countries. As the vessels are grouped by forms later, in presenting the illustrations, it is unnecessary to make further reference to this topic here, save to call attention to the accompanying plates of outlines (plates v, vi, and vii), which give in a connected series the full range of form of this group.

ESTHETIC MODIFICATIONS

It can hardly be maintained that the ancient peoples of this region had a very refined appreciation of elegance of outline, yet there are many modifications of shape that indicate a taste for higher types of beauty and a constant attempt to realize them. There is also a very decided leaning toward the grotesque. To such an extreme have the dictates of fancy been followed in this respect that utility, the true and original office of the utensil, has often taken a secondary place, although it has never or rarely been entirely lost sight of. Bowls have been fashioned into the shape of birds, fishes, reptiles, and shells, and vases and bottles into a multitude of animal and vegetal forms, without much apparent regard for convenience. Much of this imitative and imaginative art is undoubtedly the direct offspring of mythologic conceptions and superstitious practices and is thus symbolic rather than esthetic; but it seems to me highly probable that pure fancy, mere playfulness, had a place, as in more southern countries, in the creation of unusual forms.

ANIMAL FORMS

The portrayal of animal forms in one art or another was almost universal among the American aborigines, but with these middle Mis-

sissippi valley peoples it was more prevalent, perhaps, than elsewhere. Not only are many animal forms recognizably represented, but a considerable number of the grotesque shapes already referred to probably originated in representation of animals.

Ornament

The ancient potter of the middle Mississippi valley province gave particular attention to the embellishment of his ware, and the results are much more varied and mature than those of the northern and eastern sections. Nearly all methods known in the country were employed, but the higher types of linear and plastic design prevailed much more fully here than elsewhere.

The method of execution was usually by incision, a more or less sharp point being used. Finger-nail marking and indentation with a point were favorite decorations, and ridges and nodes were set on in decorative arrangements. Decoration in color was common in this province, though rare in others. The colors used in painting were white, red, brown, and black, and generally consisted of clays, white or tinted with iron oxides. Occasionally the colors used seem to have been mere stains—possibly of vegetal origin. All were probably laid on with coarse brushes of hair, feathers, or vegetal fiber. The color designs are in most cases quite simple, and are applied in broad, bold lines. The figures are, to a great extent, curvilinear, and embrace meanders, scrolls, circles, and combinations and groupings of curved lines in great variety. Rectilinear forms, lozenges, guilloches, zigzags, checkers, crosses, and stellar forms are usual, and the stepped figures so characteristic of Pueblo work are sometimes seen.

The decided prevalence of curved forms is worthy of remark. With all their fertility of invention, the inhabitants of this valley seem not to have achieved the rectangular linked meander, or anything more nearly approaching it than the current scroll or the angular guilloche, while with other peoples, such as the Pueblos of the Southwest and the ancient nations of Mexico and Peru, it was a favorite device. The reasons for this, as well as for other peculiarities of the decorative art of the province as embodied in pottery, must be sought in the antecedent and coexistent arts of the province. These peoples were probably not so highly accomplished in the textile arts as were the Pueblos, and had not felt the influence of advanced architecture as had the Mexicans. The practice of highly developed forms of these arts gives rise to and encourages angular geometric styles of decoration.

Distinguishing Characters of the Group

If asked to point out the one feature of this ware by which it could most readily be distinguished from all other groups, I should select

the bottle shape as the most satisfaetory. There is no group of primitive ware in Ameriea, save possibly in Peru, in which the slender-neeked earafe or decanter-like bottle is so marked a feature. In most of the native groups it is unknown. This, however, is not the only marked characteristic of the ware. The range of shape is very wide, and several features are strikingly unique. There are many effigy vases of remarkable eharaeter; of these may be mentioned those representing hunehback human beings, cups or vases imitating heads of men and beasts and grotesque, nondeseript creatures or eoneeptions. Again, the use of eolor in surfaee finish and deeoration is a strong characteristie of the ware. Colored ware is found in many seetions, especially in the South, but in no other part of the region eonsidered in this paper was color so generally or so fully applied to the execution of ornamental designs and realistie delineations, as in depicting wings and feathers of birds, spots of animals, costume on human figures, and in effigy vases even the color of hair, skin and face-paint—features of deeoration praetieally unknown elsewhere in the area considered. Head-shaped vases are rather rare in North Ameriea, although common in Peru. Excellent examples are found in the center of the Middle Mississippi province, and in eases are so well modeled as to have lead to the suggestion that they may be actual easts from the human face.

Sources of Information

Owing to the wide range of form and charaeter exhibited by the vessels of this group it will be impossible fully to illustrate them within the limits of this paper. The student may, in a great measure, supply the need for fuller illustration by referring to the following works: Explorations of the Aboriginal Remains of Tennessee, by Joseph Jones, Washington, 1876; Reports of the Peabody Museum, by F. W. Putnam; and Antiquities of Tennessee, by General Gates P. Thruston. These works for the most part illustrate the ware of Tennessee. Edward Evers, in Contributions to the Archeology of Missouri, presents a large number of vases of the southeast Missouri district; and an extended series of illustrations of the wares of Arkansas was published in the Fourth Annual Report of the Bureau of Ethnology.

Examples

The illustrations brought together in the aeeompanying plates comprise examples of almost every type of the earthenware of this province, but they still fail to give a satisfactory idea of the very wide range of form and ornament.

Platters, cups, and bowls

Platters and bowl-shaped vessels exhibit great diversity of size, shape, and ornament. In size they range from less than 1 inch in

diameter and depth to upward of 20 inches in diameter and a foot or more in depth. If we include under this head the so-called salt pans, described in the introduction, the greatest diameter will reach perhaps 40 inches. In material, color, and surface finish they are generally uniform with vessels of other classes. Their uses were doubtless chiefly domestic.

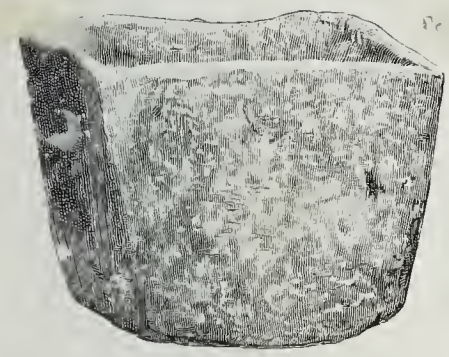
Many of these bowls are simply segments of spheres, and vary from a shallow platter to a hollow, perforated globe. Others have elongated, compressed, or conic bodies, with round or flattened bases. The horizontal outline or section may be round, oval, waved, rectangular, or irregular. Some have flattish projections at opposite sides or ends, imitating a common form of wooden tray or basin. Stands and legs are but rarely attached; handles, except those of grotesque character, are rarely seen. A dipper or ladle shape is encountered now and then.

The ornamentation of bowls was accomplished in a variety of ways. Rim modifications constitute an important feature. In section the margin or lip is square, oblique, round, or grooved. The scallop was often employed, and notched and terraced forms, resembling the sacred meal bowls of Zuni, are not uncommon. Relief ornaments such as fillets and nodes and various horizontal projections were also employed, and pleasing effects were produced by the use of incised lines and indentations.

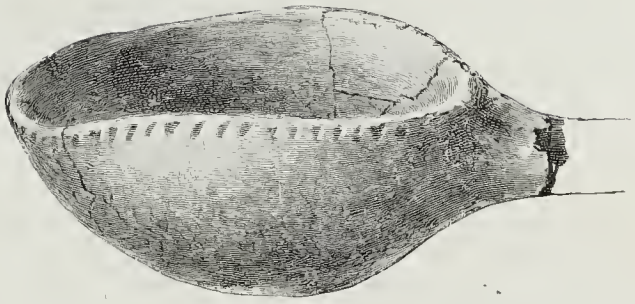
The potter was not satisfied with these varied forms of decoration, and his fancy led him to add embellishments of elaborate and extraordinary character. The nodes and ridges were enlarged and prolonged and fashioned after a hundred natural and fanciful forms. Shapes of shells, fish, birds, beasts, human and imaginary creatures were utilized in a multitude of ways. Especial attention was given to the heads of animals. These were modeled in the round and attached to the rim or side, while other parts of the animal were placed upon different portions of the vessel.

The body of the bowl was somewhat less profusely ornamented than the rim. The interior as well as the exterior received painted, relieved, and intaglio designs. In the painted bowls the favorite idea for the interior was a series of volutes, in broad lines, radiating from the center of the basin. Groups of festooned lines, either painted or engraved, and arranged to give the effect of imbricated scales, formed also a favorite motive. The exterior surface of the incurved rims of globular vessels offered a tempting surface to the artist and was often tastefully decorated in varied styles.

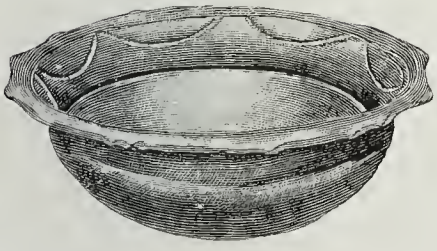
As a rule the bowls and platters of this region are fairly uniform in material, surface finish, and decorative treatment with the other vessels of the region. A somewhat unique group of bowls was obtained from a small domiciliary mound near Arkansas Post, Arkansas, two



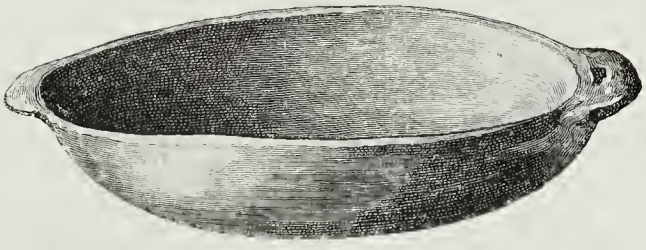
a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (ARKANSAS, DIAMETER OF BOWL 6 INCHES)



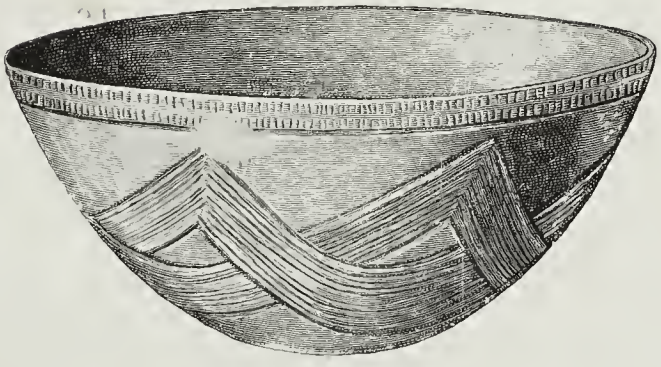
c (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



d (ARKANSAS, LENGTH 8¾ INCHES)



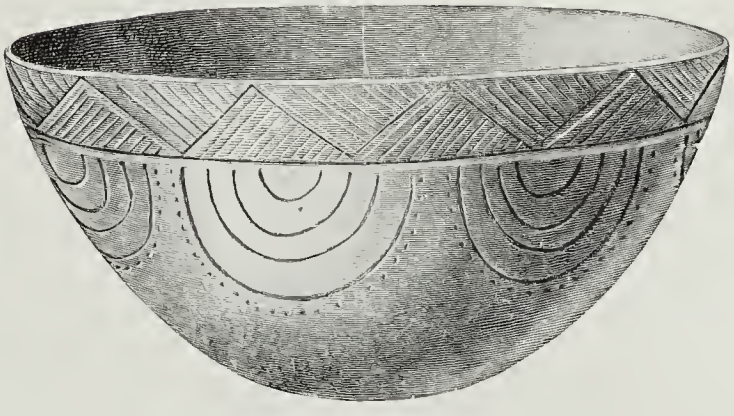
e (MISSOURI, DIAMETER 5¾ INCHES)



g (ARKANSAS, DIAMETER 11¼ INCHES)



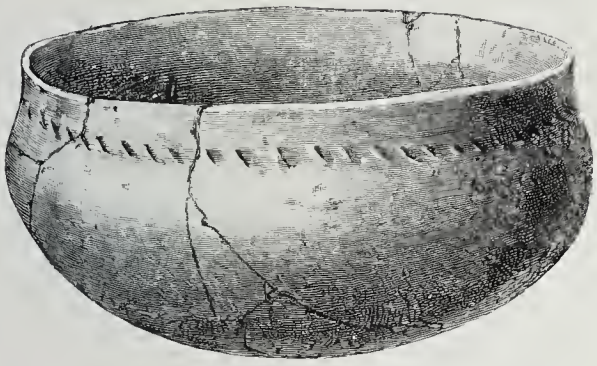
f (MISSOURI, DIAMETER 6 INCHES)



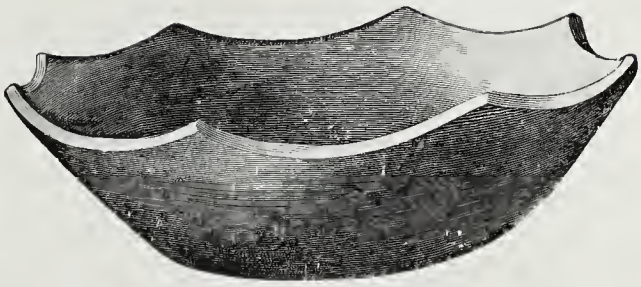
h (ARKANSAS, DIAMETER 12¾ INCHES)

CUPS AND BOWLS

MIDDLE MISSISSIPPI VALLEY GROUP



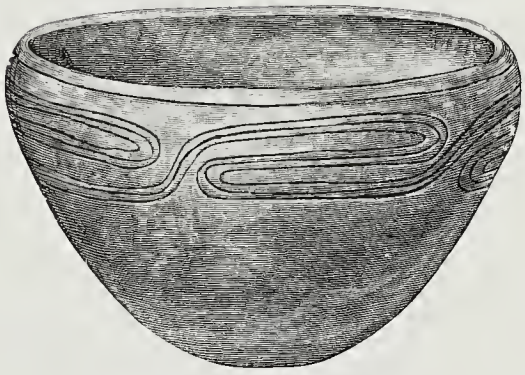
a (AKANSAS, DIAMETER 7 INCHES)



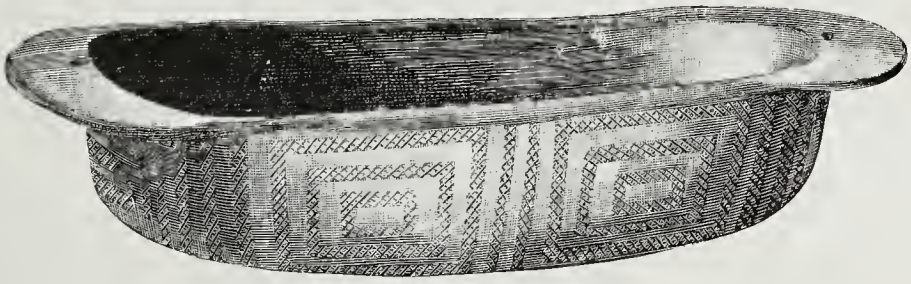
b (MISSOURI, DIAMETER 8¼ INCHES)



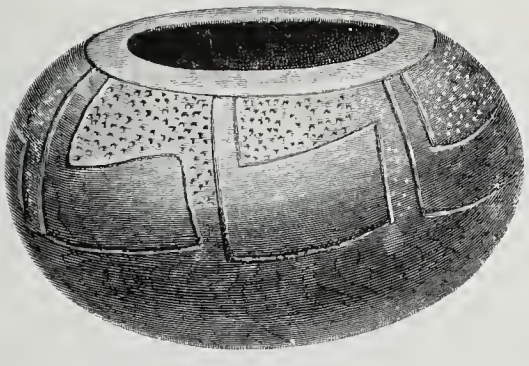
c (ARKANSAS, DIAMETER 8 INCHES)



d (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



e (ARKANSAS, LENGTH 14 INCHES)



f (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



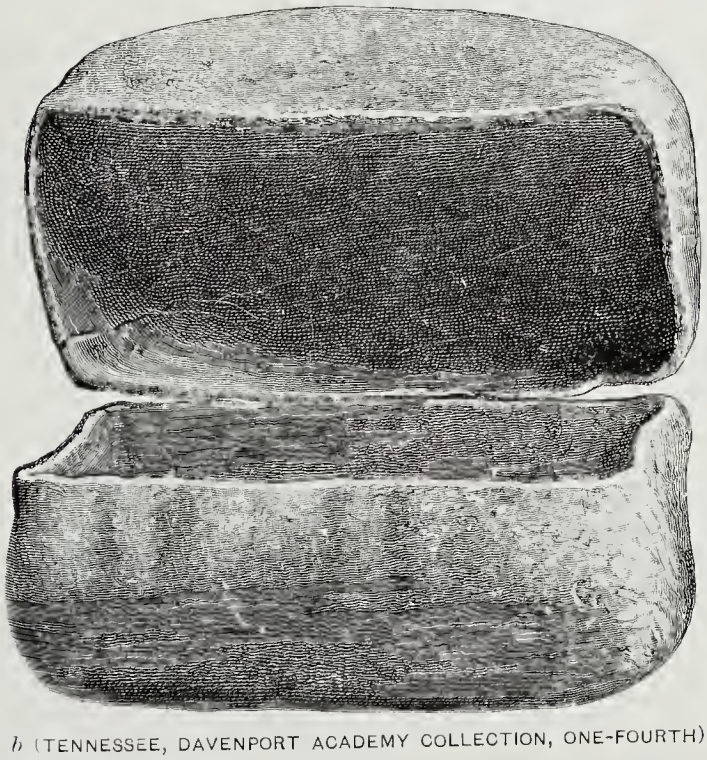
g (ARKANSAS, DIAMETER 10¼ INCHES)

CUPS AND BOWLS

MIDDLE MISSISSIPPI VALLEY GROUP



a (ARKANSAS, DIAMETER 19 INCHES)



b (TENNESSEE, DAVENPORT ACADEMY COLLECTION, ONE-FOURTH)



c (MISSOURI, M. C. LONG COLLECTION, DIAMETER 29½ INCHES)

LARGE BOWL, BURIAL CASKET, AND CALDRON

MIDDLE MISSISSIPPI VALLEY GROUP



a (TENNESSEE, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)

LARGE COOKING POTS

MIDDLE MISSISSIPPI VALLEY GROUP

illustrations appearing in plate VIII *g* and *h*. The most striking characteristic of these vessels is their ornament, which embodies some unusual combinations of lines deeply and rather boldly incised. Many of the pieces are new-looking, but a small number have been blackened by use over fire. The hemispheric shape is most common, although there are some shallow forms, and a few of the vessels have flaring rims. The paste is yellowish and the surface is roughly finished. A very large percentage of shell has been used in tempering. Other bowls of simple though varied form, and having a variety of incised decorations, are shown in the same plate. All are from graves or mounds in Arkansas, except *e* and *f*, which are from a mound in southeastern Missouri.

A second group of bowls is given in plate IX. All these are from Arkansas except *b*, which is from a contiguous locality in Missouri. An exceptionally fine piece of work is illustrated in *e*. An example of the deep cauldron-like boiling vessels found in some sections is presented in plate X *a*. A curious casket used for burying the bones of a child is given in plate X *b*. It is preserved in the collection of the Davenport Academy of Sciences, and was found in a grave at Hales point, Tennessee. One of the largest examples ever recovered in a complete state is shown in plate X *c*. It was obtained from a mound in Jefferson county, Missouri, and is 29½ inches in diameter. Most of these specimens have been described in the annual reports of the Bureau of Ethnology.

POTS

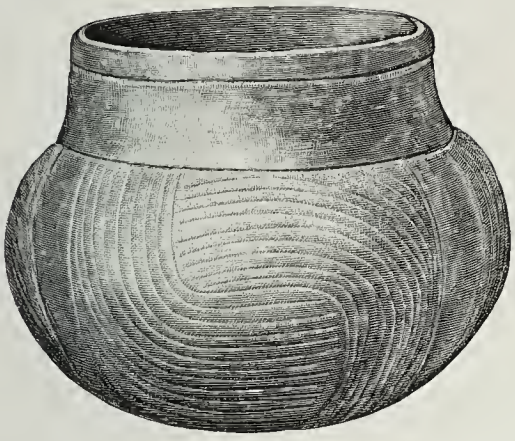
Plate XI serves to illustrate a very large class of wide-mouthed vessels of pot-like character. They are generally darkened by use over fire, and more than any other form probably served as ordinary culinary utensils. The size varies from that of a drinking cup to that of a cauldron of 15 or 20 gallons capacity. Two large and fine specimens are given in plate XII. The frequent occurrence of strong handles confirms the theory of their use for boiling and handling food. The specimens illustrated are from Tennessee and Arkansas.

The rims of these vessels were modified for decorative purposes very much as are the rims of the bowls. The bodies are sometimes elaborately ornamented, mostly with incised figures, but often with punctures, nodes, and ribs. The incised lines, curved and straight, are arranged to form simple patterns encircling the upper part of the vessel. The punctures, made with a sharp point, form encircling lines and various carelessly executed patterns. A rude sort of ornamentation was produced by pinching up the soft clay of the surface between the nails of the fingers and thumb. Relief ornament consists chiefly of applied fillets of clay arranged to form vertical ribs. Rows of nodes are sometimes seen, and in a few cases the whole body is covered with rude nodes or spines (see plate XI).

BOTTLES

Of all the forms of vessels found in this province the bottle is the most varied and interesting, and is more suggestive of the advanced taste of the potter than is any other class of vessel. In plate XIII some fine examples of bottles are shown. Two neat specimens are illustrated in *a* and *b*. The surface finish is excellent in both cases. The lines of the figures are carefully drawn, and seem to have been produced by trailing a smooth, rather blunt point, under even pressure. It is difficult to get a line so even and nicely finished by simple incision or by excavating the clay. The design in *a* consists of groups of curved lines arranged in pairs, which are separated by plain vertical bands. It might be considered an interrupted or imperfectly connected form of the running scroll. This grouping of lines is frequently met in the decorative designs of the southern states. The design on the other vase, *b*, is still more characteristic of the South. It consists of an encircling row of round, shallow indentations, about which are linked series of imperfectly developed incised scrolls, and of two additional rows of depressions, one above and the other below, through which parallel lines are drawn. The handome vase shown in *c* was obtained, along with many other fine specimens, from mounds near Little Rock, Arkansas. It is of the dark polished ware with the usual fire mottlings. The form is symmetric and graceful. The neck is ornamented with a band of incised chevrons, and the sloping upper surface of the body is encircled by a series of stepped figures engraved in the plastic clay. The vessel shown in *d* has a wide annular base and a body apparently compounded of a large flattish form and a smaller kettle-like form set upon it. The latter is furnished with handles and decorated with encircling lines of indentations. The vessel shown in *e* may be taken as a type of a very large class. It is most readily described as a short-necked, wide-mouthed bottle. It is symmetric and nicely finished. The lip is supplied with a narrow horizontal rim. The body expands somewhat abruptly from the base of the upright neck to the squarish shoulder, and contracts below in an even curve, giving a hemispheric base. We have in *f* a good example of a class of bottle-shaped vessels, the necks of which are wide and short and the bodies much compressed vertically. It is a handome vase, symmetric, quite dark in color, and highly polished. The upper surface of the body is ornamented with a collar formed of a broad fillet of clay, or rather of two fillets, the pointed ends of which come together on opposite sides of the vase.

As skilled as these people were in modeling life forms and in engraving geometric devices, they seem rarely to have attempted the linear representation of life forms. We have, however, a few good examples of such work. The engraved design covering the body of a



a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



c (ARKANSAS, HEIGHT 8 INCHES)



d (ARKANSAS, HEIGHT 7 INCHES)



e (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



f (ARKANSAS, DIAMETER 9 INCHES)

BOTTLES

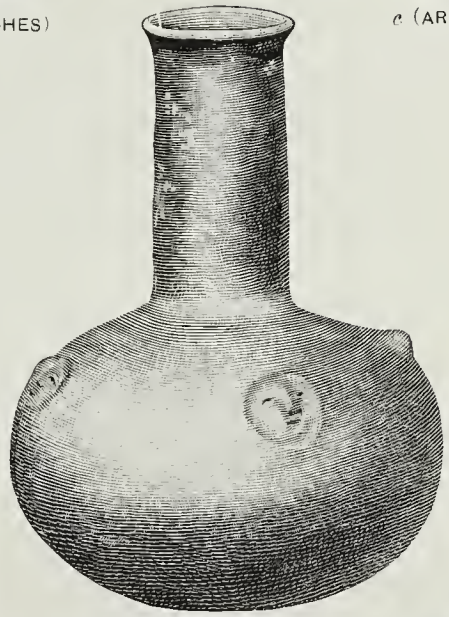
MIDDLE MISSISSIPPI VALLEY GROUP



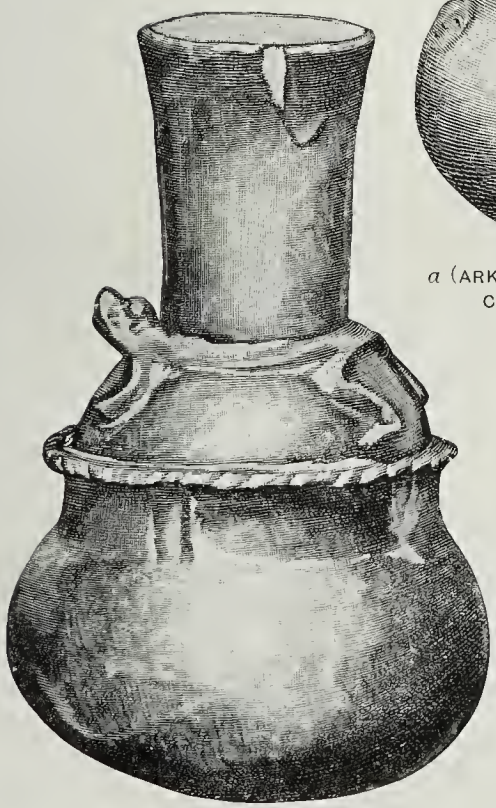
b (ARKANSAS, HEIGHT 7 INCHES)



c (ARKANSAS, HEIGHT 9 INCHES)



a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



d (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



e (ARKANSAS, HEIGHT 10¼ INCHES)

BOTTLES

MIDDLE MISSISSIPPI VALLEY GROUP

small vase, figure 49, is one of the most remarkable ever obtained from the mounds. It consists of two winged and crested rattlesnakes which encircle the expanded part of the vessel, and of two sunflower-like figures alternating with them. These designs are carefully engraved with a needle-like point and are adjusted to the form of the vase in a way that suggests forethought and experience and an

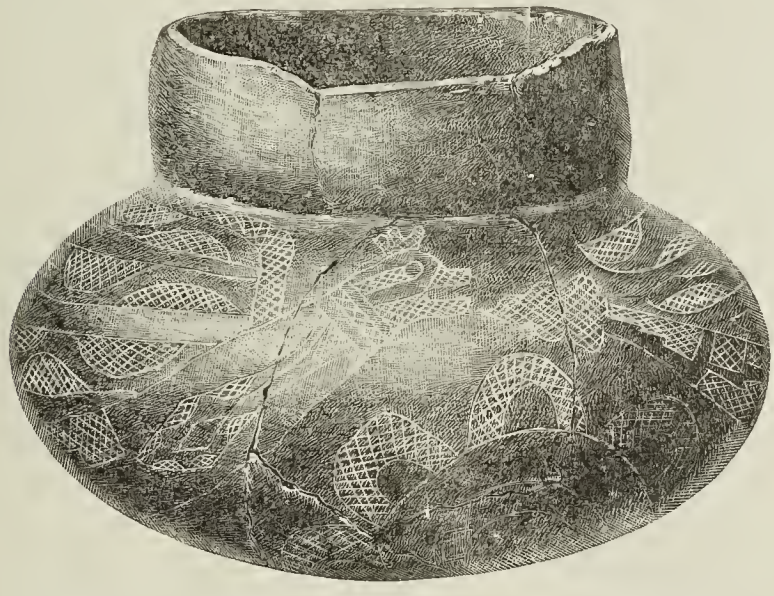


FIG. 49—Bottle decorated with serpent designs, Arkansas. Three-fourths actual size.

appreciation of the decorative value of the figures. By dint of rubbings, photographs, and sketches, a complete drawing of the various figures has been obtained, and they are given in figure 50 on a scale of about one-third actual size. The rosette figures probably represent the sun. There can be little doubt that the figures of this design are derived from the mythologic art of the people.

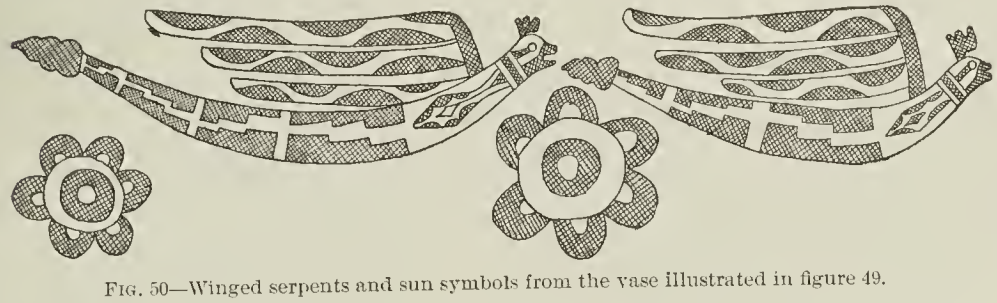


FIG. 50—Winged serpents and sun symbols from the vase illustrated in figure 49.

The ancient potter of the central districts did not venture, save in very rare cases, to delineate the human figure graphically, and such attempts as have come to hand do not do much credit to the artistic capacity of the people. A specimen is shown in figure 51, the four figures in simple lines occupying the periphery of the body of a large plain bottle of the usual dark-colored ware of eastern Arkansas.

In plate XIV we have selections from the very large group of high-necked bottles. The piece shown in *a* is a good illustration of a type of form common to Missouri and Arkansas. The neck is high and cylindric and the body resembles a slightly flattened globe. Set about the shoulder are four medallion-like faces, the features of which are modeled roughly in low relief. The ware is of the ordinary dark, slightly polished variety. There are few vases from the mound region more pleasing in appearance than that shown in *b*. It is a black, well-polished bottle with neck expanding below and body peculiarly flattened beneath. The body is encircled by a band of chaste and elaborate scroll work.

A handsome bottle-shaped vase with flaring lip is shown in *c*. The neck widens toward the base and the body is subglobular, being slightly conical above and rather abruptly expanded at the periphery. The surface is only moderately smooth. The body is ornamented with a handsome design of incised lines, which consists of a scroll pattern, divided into four sections by perpendicular lines.

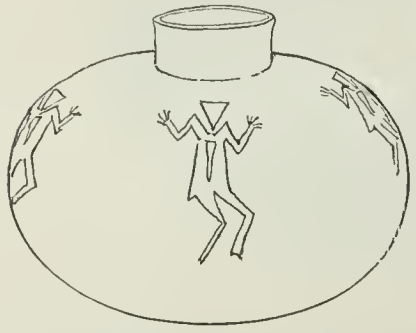


FIG. 51—Bottle ornamented with four engraved human figures, Arkansas. One-fifth actual size.

The vase shown in *d* is compound, and represents a bottle set within the mouth of a pot. The neck is high, wide, and flaring, and rests on the back of a rudely-modeled frog, which lies extended on the upper surface of the body. The notched encircling ridge, beneath the feet of the creature, represents the rim of the lower vessel, which is a pot with compressed globular body and short, wide neck. This vase is of the dark, dead-surfaced ware and is quite plain. Four vertical ridges take the place of handles.

One of the most striking of the bottle-shaped vases is shown in *e*. It is symmetric, well-proportioned, and well-finished. The color is dark and the surface is roughened by a multitude of pits which have resulted from the decay of shell particles used for tempering. The paste crumbles to a brownish dust when struck or pressed forcibly. The most remarkable feature of the piece is the broad, convex, hood-like collar that encircles the neck and spreads out over the body like an inverted saucer. This collar is curiously wrought in incised lines and low ridges, by means of which grotesque faces, suggesting owls, are produced. The eyes are readily detected, being indicated by low knobs with central pits, each surrounded by three concentric circles. They are arranged in pairs on opposite sides. Between the eyes of each pair an incipient nose and mouth may be made out. The face is outlined below by the lower edge of the collar and above by a low indented ridge crossing the collar tangent to the base of the neck. The



a (ARKANSAS, HEIGHT 8 INCHES)



b (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



c (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



d (ARKANSAS HEIGHT 7½ INCHES)

BOTTLES

MIDDLE MISSISSIPPI VALLEY GROUP



a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



c (MISSOURI, HEIGHT 9⅛ INCHES)



d (MISSOURI, HEIGHT 8⅛ INCHES)

BOTTLES

MIDDLE MISSISSIPPI VALLEY GROUP



VARIOUS FORMS OF BOTTLES

MIDDLE MISSISSIPPI VALLEY GROUP

HELIOTYPE CO., BOSTON.

most expanded part of the body is encircled by an incised pattern consisting of five sets of partially interlocked scrolls.

A step in differentiation of form is illustrated in the vessels presented in plate XV. A flat bottom would serve to keep a tall bottle in an upright position on a hard, level floor, but a ring was still better, and could be added without deformation of the vessel. Annular bands of varying heights and shapes were used, several forms being illustrated in this plate.

The tripod afforded even better support than the ring, and had come into common use with these people; four legs, in imitation of the legs of quadrupeds, were occasionally employed. The form of these supports is extremely varied, and some of the more usual types are illustrated in plate XVI. The first, *a*, is a large-necked, rather clumsy vessel of ordinary workmanship, which rests on three globular legs. These are hollow, and the cavities connect with that of the body of the vessel. The whole surface is well polished and dark in color.

The vessel depicted in *b* has a number of noteworthy features. It resembles the preceding in shape with the exception of the legs, which are flat, and have stepped or terraced margins. The whole surface of the vessel is a warm gray, and is decorated with characteristic designs in red and white. A stepped figure encircles the neck, and semicircular figures in white appear on opposite sides at the top and base. The body is covered with scroll work in broad, red lines, the spaces being filled in with white. Each leg is half red and half white. The bottle *c* is from Missouri, and is of the plain dark ware. The specimen shown in *d* is finished in plain red.

For the purpose of conveying an idea of the great variety of shape characterizing the simple bottles of this group and the boldness of the painted decoration the series presented in plate XVII have been assembled. The four pieces in the first group are of the plain, dark ware and have annular bases. Those of the second group are supported on tripods; the series beneath shows variations in the form of the body; and the specimens in the third line illustrate the use of designs in white, red, and black.

ECCENTRIC AND COMPOUND FORMS

Three vessels are shown in plate XVIII *a*, *b*, and *c* which in form resemble the common teapot. The specimen shown in *b* is well made and carefully finished. A spout is placed on one side of the body and a low knob on the other. The latter is not a handle but represents, rather, the head of an animal. These characters are repeated in most of the specimens of this type that have come to my notice. Two small circular depressions occur on the sides of the vessel alternating with the spout and the knob, and these four features form centers about which are traced four volutes connecting around the vessel. In

a fine red piece from Mississippi, now in the National Museum collection (plate XL *b*), the knob is replaced by the head of a turtle or other reptile and the spout becomes the creature's tail. In connection with the teapot-like vessels it will be well to describe another novel form not wholly unlike them in appearance, an example being shown in *d*, plate XVIII. The shoulder is elongated on opposite sides into two curved, horn-like cones, which give to the body a somewhat crescent-shaped outline. The vessel is of the ordinary plain, dark ware and has had an annular base which is now broken away.

Vases with arched handles, like those shown in *e* and *f*, are quite common. In some cases the handle is enlarged and the body reduced until the vessel assumes the appearance of a ring. Similar forms are common in other parts of the American continent, especially in Peru.

Vases of compound form are of frequent occurrence in this region. A number of examples in outline have been assembled for convenience of comparison in plate VII, and many others could be added.

LIFE FORMS

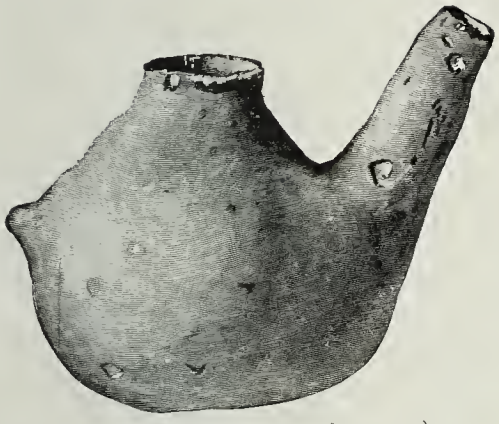
Clay vessels imitating in form marine and fresh-water shells are occasionally obtained from the mounds and graves of the Mississippi valley. The conch shell appears to have been a favorite model, especially as modified for a drinking cup by the removal of one side of the walls and all the interior parts (plate XIX, *a* and *b*). A two-story cup of the same class is shown in *c*. The clam shell is also imitated. The more conventional forms assumed by these vessels are especially interesting as illustrating the varied ways in which life forms modify the normal conventional shapes of vessels, thus widening the range of the art.[a]

A very good illustration of this class of vessel is given in *d*. It is evidently intended to imitate a trimmed conch shell. The apex and a few of the surrounding nodes are shown at the right, while the base or spine forms a projecting lip at the left. A coil of clay forms the apex, and is carried outward in a sinistral spiral to the noded shoulder. Excellent examples in clay, imitating clam shells, are illustrated in General Thruston's work on the Antiquities of Tennessee, plate VI (plate XLVII of this paper).

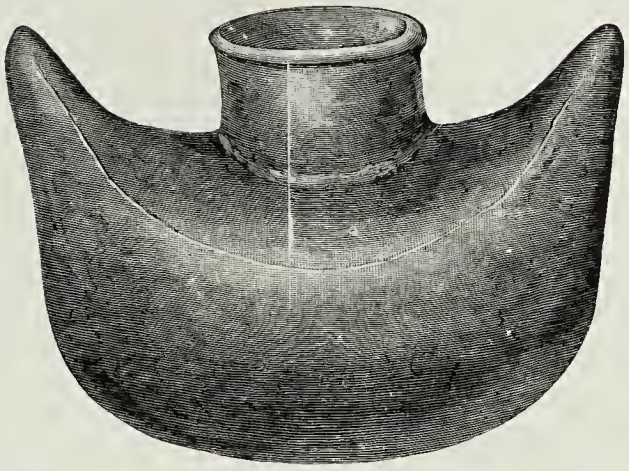
In many countries the shape of earthen vessels has been profoundly influenced by vegetal forms and especially by the hard shells of fruits.[b] The gourd, the squash, and the cocoanut are reproduced with great frequency. In many cases the shape of the body of vases not at once suggesting derivation from such forms may finally be traced to them. Thus the lobed bottles of Tennessee probably owe their chief characteristic to a lobed form of the gourd. In plate XIX *f* and *g*

[a] For studies of shell vessels and their influence on ceramic forms, see Second Annual Report, Bureau of Ethnology, p. 192, and Fourth Annual Report, Bureau of Ethnology, pp. 384 and 454.

[b] This subject is discussed in a paper on form and ornament in the ceramic art, Fourth Annual Report, Bureau of Ethnology, p. 446.



a (ARKANSAS, HEIGHT 3¾ INCHES)



d (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



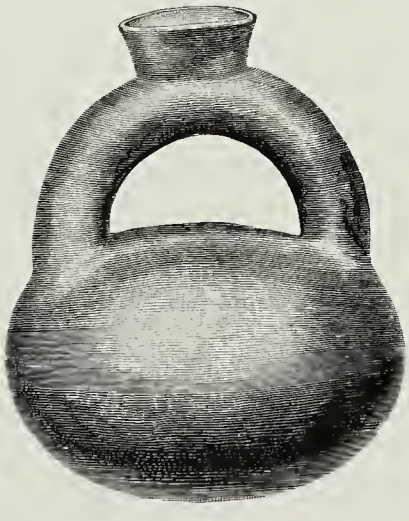
b (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



c (ARKANSAS, HEIGHT 4 INCHES)



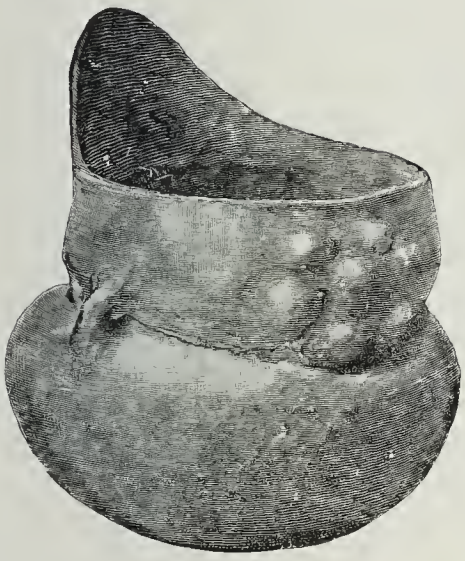
e (ARKANSAS, DIAMETER 7 INCHES)



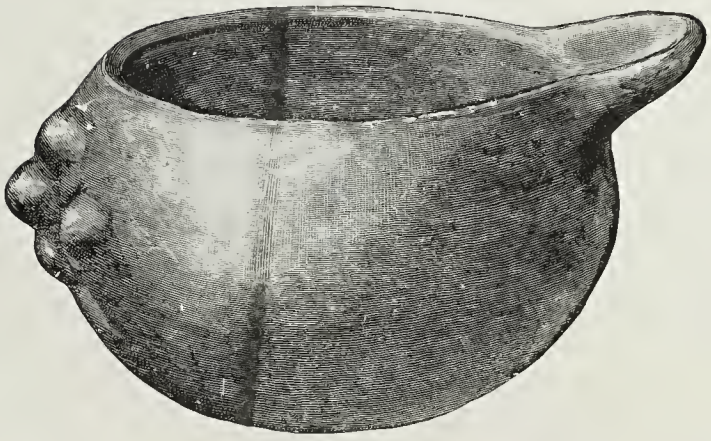
f (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)

BOTTLES OF ECCENTRIC SHAPE

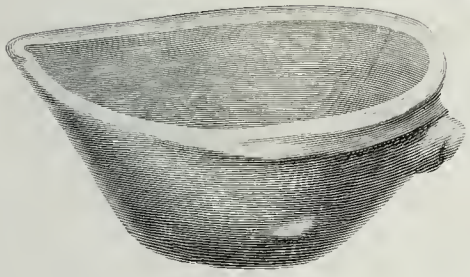
MIDDLE MISSISSIPPI VALLEY GROUP



c (MISSOURI, DIAMETER 4 INCHES)



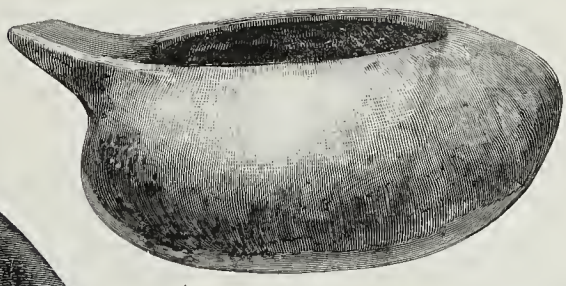
a (MISSOURI, DIAMETER 5 INCHES)



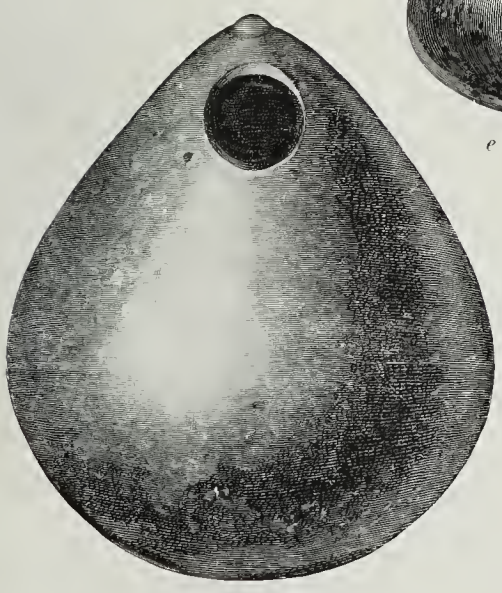
d (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (MISSOURI, LENGTH 5½ INCHES)



e (MISSOURI, LENGTH 7¼ INCHES)



f (ARKANSAS, HEIGHT 5 INCHES)



g (ARKANSAS, HEIGHT 7 INCHES)

VESSELS IMITATING SHELL AND GOURD FORMS

MIDDLE MISSISSIPPI VALLEY GROUP



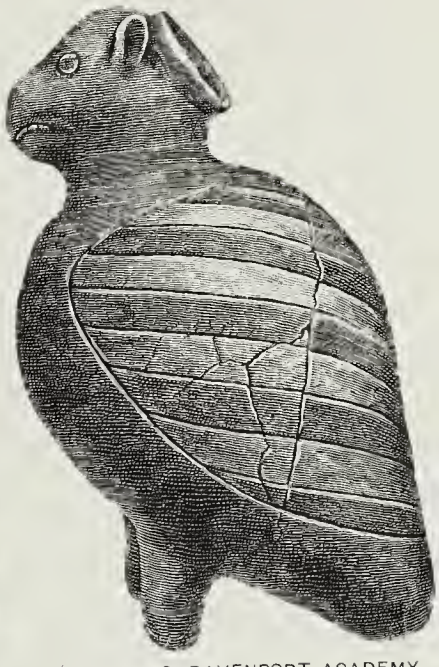
a (MISSOURI, DIAMETER 8 INCHES)



b (MISSOURI, DIAMETER 4¼ INCHES)



c (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



e (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



d (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



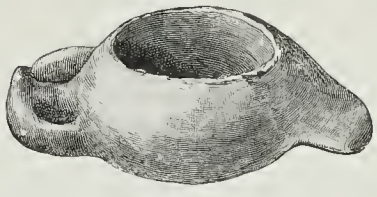
f (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)

BOWLS IMITATING BIRD FORMS

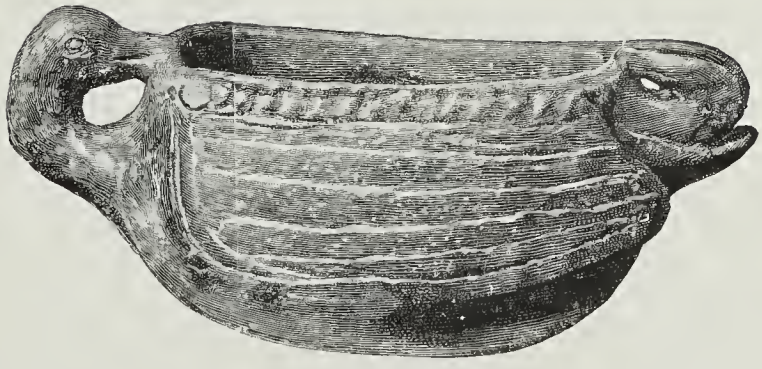
MIDDLE MISSISSIPPI VALLEY GROUP



a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



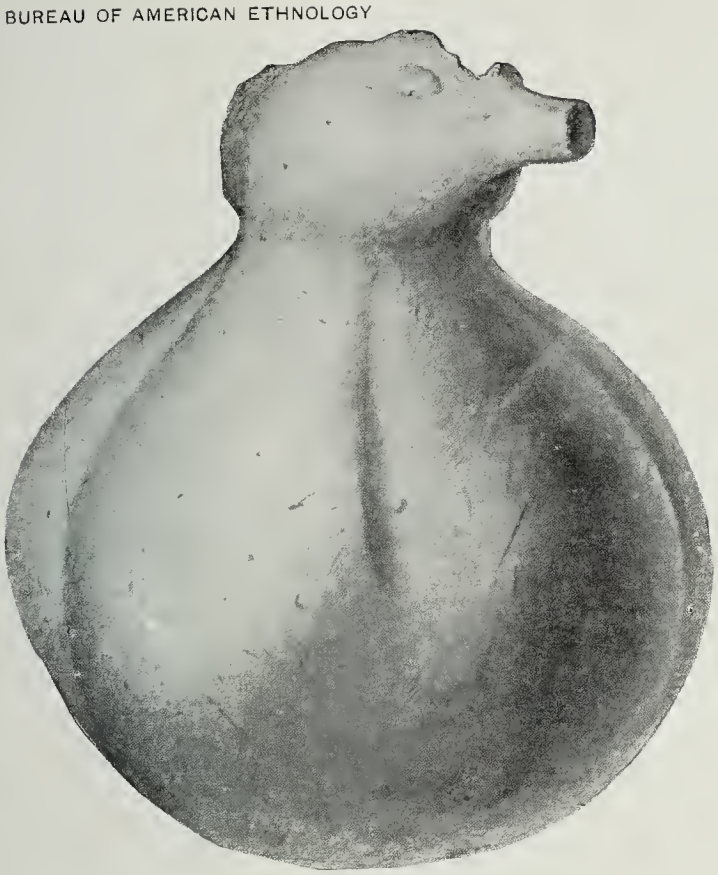
c (MISSOURI, LENGTH 2 INCHES)



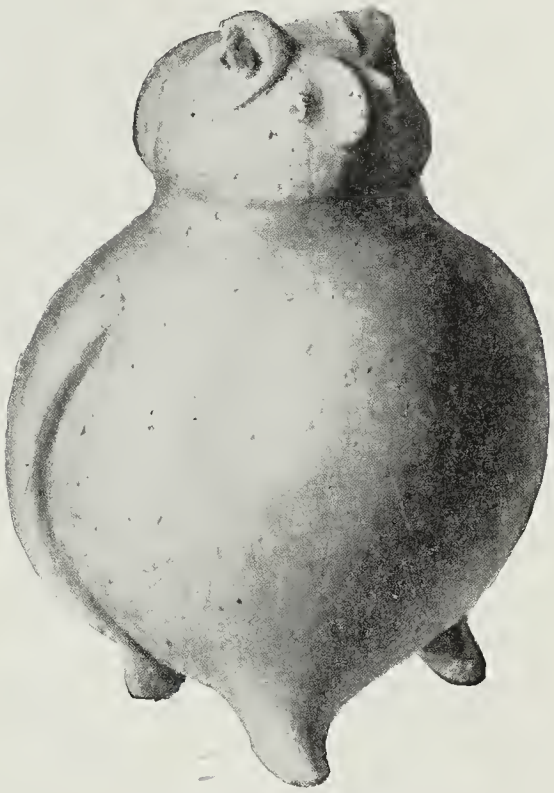
b (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)

VESSELS IMITATING BIRD FORMS

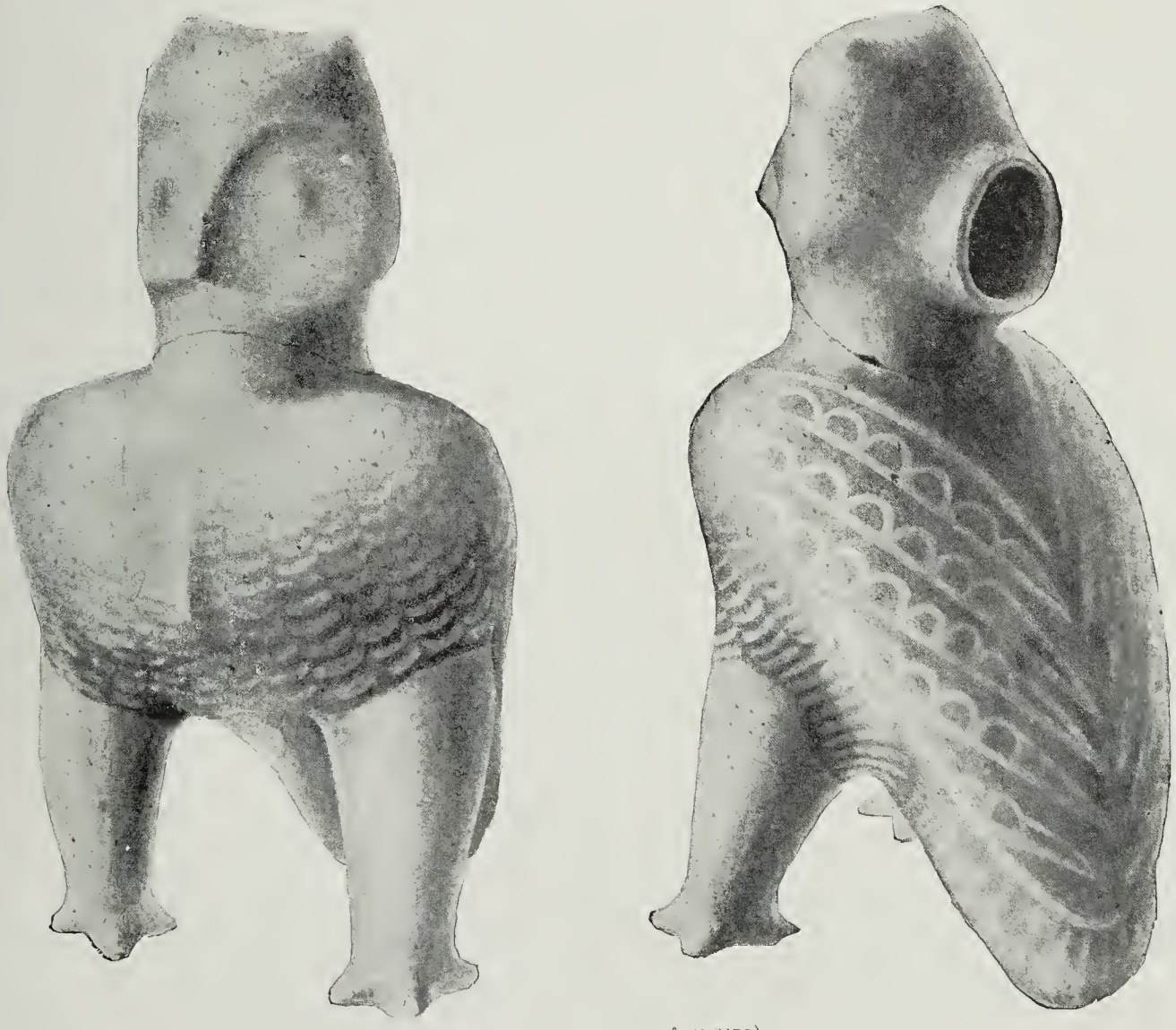
MIDDLE MISSISSIPPI VALLEY GROUP



a (MISSOURI, HEIGHT 5¾ INCHES)



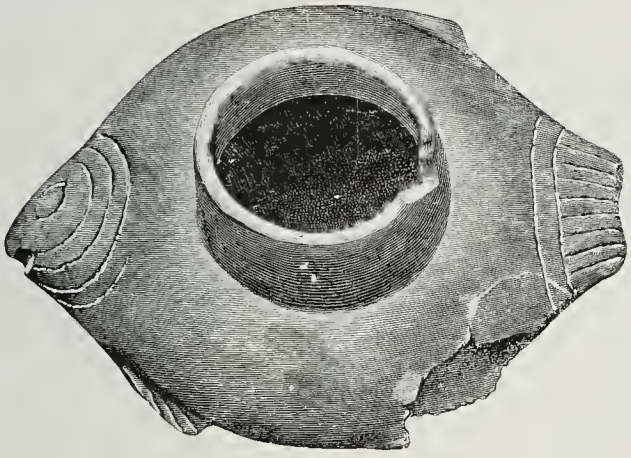
b (MISSOURI, HEIGHT 6¾ INCHES)



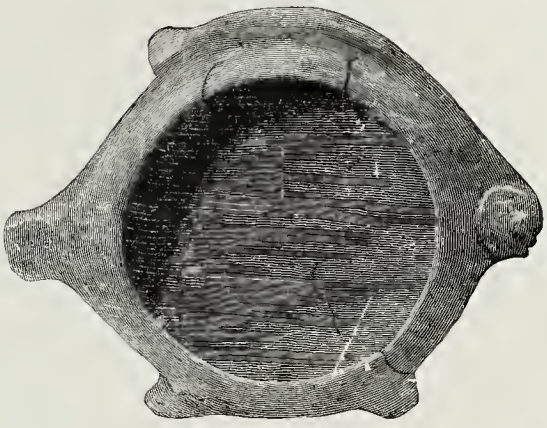
c (TENNESSEE, HEIGHT 9¾ INCHES)

VESSELS IMITATING BIRD FORMS

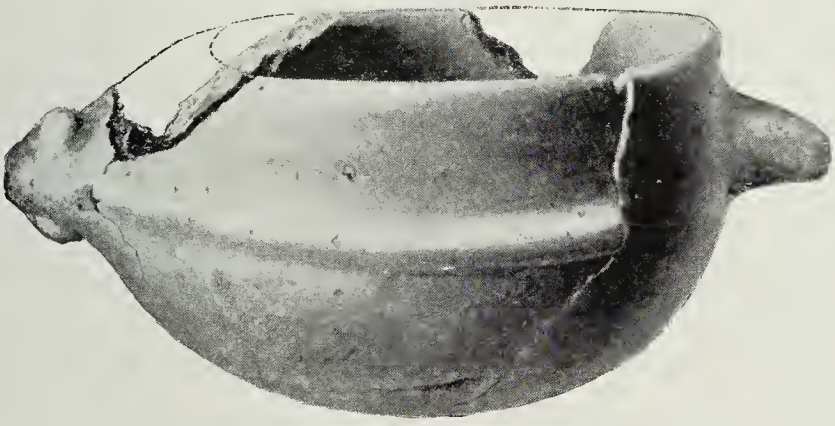
MIDDLE MISSISSIPPI VALLEY GROUP



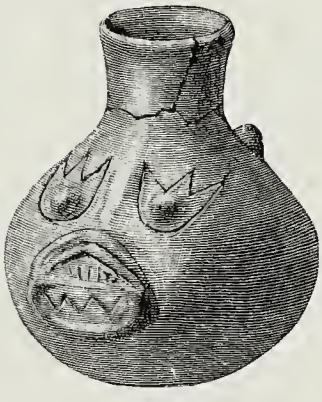
a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



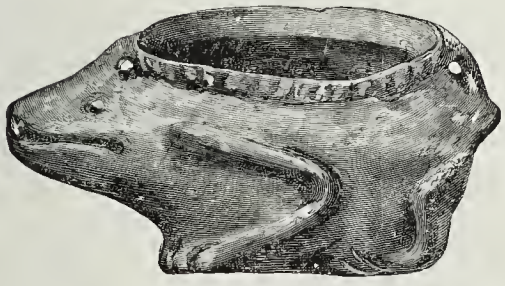
b (MISSOURI, LENGTH 7¾ INCHES)



c (MISSOURI, LENGTH 8 INCHES)



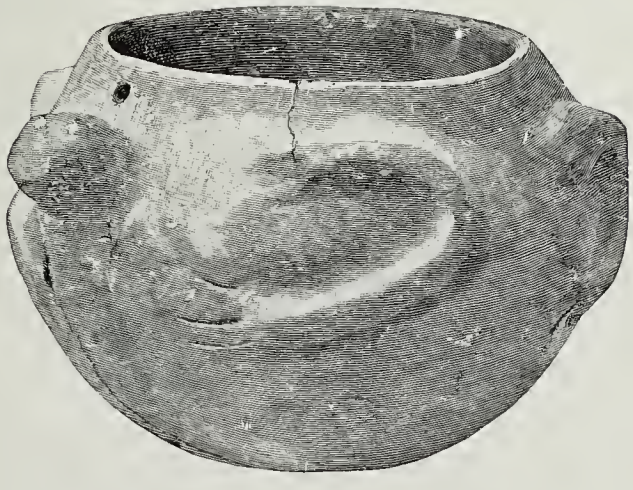
d (ARKANSAS, DIAMETER 3½ INCHES)



e (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



g (ARKANSAS. DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



f (MISSOURI, DIAMETER 5½ INCHES)



h (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)

VESSELS IMITATING FISH AND BATRACHIAN FORMS

MIDDLE MISSISSIPPI VALLEY GROUP



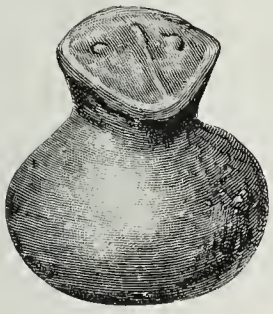
a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)

VESSELS IMITATING ANIMAL FORMS

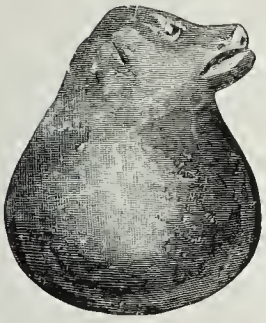
MIDDLE MISSISSIPPI VALLEY GROUP



a (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



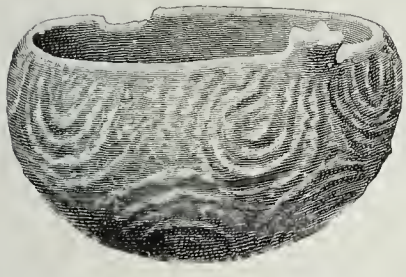
e (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (TENNESSEE, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



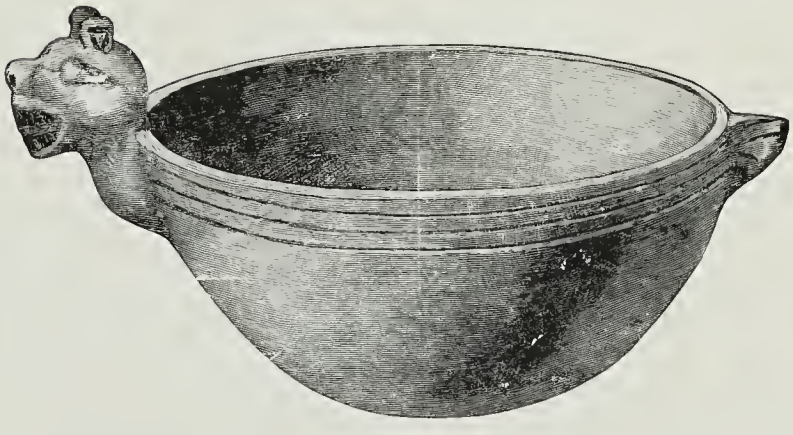
f (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



c (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



d (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



g (ARKANSAS, LENGTH 10½ INCHES)

VESSELS IMITATING ANIMAL FORMS

MIDDLE MISSISSIPPI VALLEY GROUP

two examples of gourd-shaped vessels from Arkansas are given. The Tennessee forms are fully illustrated by General Thruston (work cited).

Plates XX, XXI, XXII are intended to illustrate the treatment of animal forms by the ancient potter. The animals imitated cover a wide range, including probably a large percentage of the more important creatures of the Mississippi valley. The manner of applying the forms to the vessel is also extremely varied, making a detailed account quite impossible. The degree of realism is far from uniform. In many cases birds, fishes, and quadrupeds are modeled with such fidelity that a particular species is forcibly suggested, but the larger number of the imitations are rude and unsatisfactory. Many forms are grotesque, sometimes intentionally so. In plate XX are several illustrations of the manner of applying bird forms to the elaboration and embellishment of bowls. Specimens *a* and *b* are from southeastern Missouri. The peculiar form of head seen in *a* is found all over the lower Mississippi and Gulf regions, while the example *c* has the head turned inward, and resembles a vulture or buzzard. In *d* two heads are attached, both grotesque, but having features suggestive of birds. A finely modeled and finished bird-shaped bottle is shown in *e*. It is finished in red, black, and white, the wings being striped with red and white. The heads in *b* and *f* appear to have human features, but it is not improbable that the conception was of a bird or at most of a bird-man compound.

A very striking specimen is shown in plate XXI*a*, the neck of the bird being unusually prolonged. In *b* the bird is placed on its back, the head and feet forming the handles of the vessel. The wings are rudely represented by incised lines on the body of the vessel. Other bird forms are shown in plate XXII. The delineation of the painted specimen *c* is unusually realistic, and the general appearance recalls very forcibly the painted owl vases of the Tusayan tribes and the more ancient occupants of the valley of the Rio Colorado.

The usual manner of treating forms of fish is shown in plate XXIII *a*, *b*, and *c*. The exceptional application of the fish form to a bottle is illustrated in *d*. The frog or toad was a favorite subject for the aboriginal potter, and two ordinary examples are presented in *e* and *f*. The originals of *g* and *h* are not readily made out.

The use of mammalian forms in vase elaboration is illustrated in plates XXIV and XXV. There can be but little doubt that the potter had a deer in mind when plate XXIV*a* was modeled, while *b* suggests the opossum. But the originals for the specimens presented in plate XXV are not readily identified, and the head in *e* is decidedly grotesque, although it is not impossible that the particular species of animal intended in this and in other cases may finally be made out.

Plates XXVI, XXVII, and XXVIII serve to illustrate some of the varied methods of employing the human figure in ceramic art. In plate XXVI five bottles are shown; *a* represents the entire figure, and *b* the entire

figure seated upon the globular body of the vessel, while *c* and *d* are average examples of the hunchback figures so common in the art of this region. It seems probable that persons suffering from this class of deformity were regarded as having certain magic powers or attributes. A small blackish bottle, capped with a rudely modeled human head, is illustrated in *e*. The opening in all of these figurines is at the top or back of the head.

A number of novel forms are given in plate XXVII. In *a* the heavy figure of a man extended at full length forms the body of the bottle. The treatment of the figure is much the same in *b*, and other forms are shown in *c*, *d*, *e*, and *f*. A very interesting specimen is shown in plate XXVIII. The figure represents a woman potter in the act of modeling a vase.

In plate XLIII we have two examples of the remarkable head vases, probably mortuary utensils, found in considerable numbers in graves in eastern Arkansas and contiguous sections of other states. The faces have been covered with a whitish wash well rubbed down, the remainder of the surface being red. Fuller descriptive details are given in preceding pages and in the Fourth Annual Report of the Bureau of Ethnology. Additional specimens are shown in plates XXIX, XXX, XXXI, and XXXII. Specimen *a* of plate XXIX has two owl-like faces modeled in low relief on opposite sides of the body, and *b* is embellished with a well-suggested human mask painted white and having closed eyes. The striking vessel presented in *c* and in plate XLIII *b* and plate XXX serves well as a type of the mortuary death's-head vases, and the various illustrations will serve to convey a very complete idea of their character. So well is the modeling done and so well is the expression of death on the face suggested that some students have reached the conclusion that this and other specimens of the same class are bona fide death masks, made possibly by coating the dead face with clay and allowing it to harden, then pressing plastic clay into this mold. Mr Dellenbaugh[a] has urged this view, but it is difficult to discover satisfactory evidence of its correctness. Most of the heads and faces of this group are so diminutive in size and so eccentric in shape that ordinary modeling was necessarily employed, and this implies the skill necessary to model the larger specimens. This head (plate XXX), which is the largest of the group, is only 6 inches in height, and if cast from the actual face, would thus represent a young person or one of diminutive size. My own feeling is that to people accustomed to model all kinds of forms in clay, as were these potters, the free-hand shaping of such heads would be a less difficult and remarkable undertaking than that of molding and casting the face, these latter branches of the art being apparently unknown to the mound-building tribes.

[a] Dellenbaugh, F. S., Death mask in ancient American pottery, American Anthropologist, February 1897.



a (MISSOURI, HEIGHT 5¼ INCHES)



c (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



b (MISSOURI, HEIGHT 9½ INCHES)



d (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



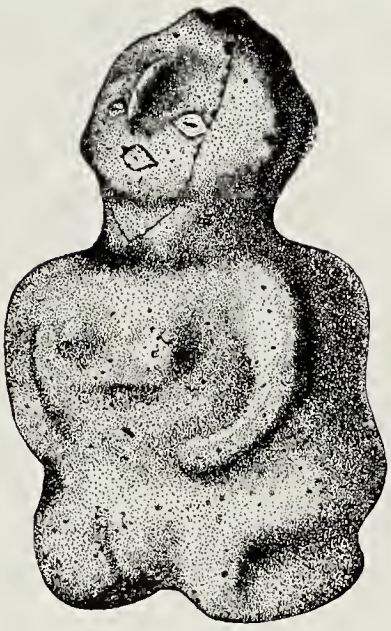
e (ARKANSAS, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)

VESSELS IMITATING THE HUMAN FORM

MIDDLE MISSISSIPPI VALLEY GROUP



a (MISSOURI, EVERS COLLECTION, HEIGHT 6 INCHES)



e (TENNESSEE, HEIGHT 7½ INCHES)



c (ARKANSAS, DIAMETER 5¾ INCHES)

d (ARKANSAS, LENGTH 11 INCHES)



b (ARKANSAS, WIDTH 7 INCHES)



f (ARKANSAS, HEIGHT 8¾ INCHES)

VESSELS IMITATING THE HUMAN FORM

MIDDLE MISSISSIPPI VALLEY GROUP



VESSEL REPRESENTING THE POTTER AT WORK (INDIANA)

MIDDLE MISSISSIPPI VALLEY GROUP

(HEIGHT 7 INCHES)

HELIOTYPE CO., BOSTON.

In form this particular vessel is a simple head, 6 inches in height and 6 inches wide from ear to ear. The aperture of the vase is in the crown, and is surrounded by a low, upright rim, slightly recurved. The cavity is roughly finished, and follows pretty closely the contour of the exterior surface, except in projecting features such as the ears, lips, and nose. The walls are from one-eighth to one-fourth of an inch in thickness, the base being about three-eighths of an inch thick. The bottom is flat, and on a level with the chin and jaw.

The material does not differ from that of the other vessels of the same locality. It contains a large percentage of shell, some particles of which are quite large. The paste is yellowish gray in color and rather coarse in texture. The vase was modeled in the plain clay and permitted to harden before the devices were engraved. Afterward a thick film of fine yellowish-gray clay was applied to the face, partially filling up the engraved lines. The remainder of the surface, including the lips, received a thick coat of dark red paint. The whole surface was then polished.

The illustrations will convey a more vivid conception of this striking head than any description that can be given. The face can not be said to have a single feature strongly characteristic of Indian physiognomy; instead, we have the round forehead and the projecting chin of the African. The nose, however, is small and the nostrils are narrow. The face would seem to be intended for that of a young person, perhaps a female. The features are well modeled, and the artist must have had in his mind a pretty definite conception of the face to be produced, as well as of the expression appropriate to it, before beginning his work. It is possible even that the portrait of a particular face was intended. The closed eyes, the rather sunken nose, and the parted lips were certainly intended to give the effect of death. The ears are large, correctly placed, and well modeled; they are perforated all along the margins, thus revealing a practice of the people whom they represented. The septum of the nose appears to have been pierced, and the horizontal depression across the upper lip may indicate the former presence of a nose ornament.

Perhaps the most unique and striking feature is the pattern of incised lines that covers the greater part of the face. The lines are deeply engraved and somewhat "scratchy," and were apparently executed in the hardened clay before the slip or wash of clay was applied. The left side of the face is plain, excepting for a figure somewhat resembling a grappling hook in outline, which partially surrounds the eye. The right side is covered with a comb-like pattern, placed vertically with the teeth upward. The middle of the forehead has a series of vertical lines and a few short horizontal ones just above the root of the nose (see plate XXX). In plate XXIX *c* a [illegible] of the front face is given, and the engraved figure is projected at the

side. The significance of these markings, which no doubt represent tattooed or painted figures, can only be surmised in the most general way. It happens that some rather indistinct markings at the corner of the mouth have been omitted in the engraving.

It is observed that on the forehead, at the top, there is a small loop or perforated knob. Similar appendages may be seen on many of the clay human heads from this valley. A Mexican terra-cotta head, now in the Museo Nacional, Mexico, has a like feature, and, at the same time, has closed eyes and an open mouth.

A head covering, possibly the hair conventionally treated, extends over the forehead and falls in a double fold over the back of the head, terminating in points behind, as is seen in plate XXIX *c*.

Another vase of a very similar character, now in the Davenport, Iowa, Museum, is about one-half the size of this. The face is much mutilated. A third specimen, also in the Davenport collection, is somewhat larger than the one illustrated in plates XXIX *c* and XXX, but is nearly the same in finish and color. The face has the same semblance of death, but the features are different, possessing somewhat decided Indian characteristics, and there is no tattooing.

The specimen shown in plate XLIII *a*, and again in plate XXXI, was exhumed at Pecan point by agents of the Bureau of Ethnology. In size, form, color, finish, modeling of features, and expression, this head closely resembles the one first described. The work is not quite so carefully executed and the head probably has not such pronounced individuality. The curious engraved device that, in the other example, appeared near the left eye here occurs on both sides. The lower part of the face is elaborately engraved. Three lines cross the upper lip and cheeks, reaching to the ear; a band of fret-like devices extends across the mouth to the base of the ears, and another band, filled in with oblique, reticulated lines, passes around the chin and along the jaws. The ears are perforated as in the other case, and the septum of the nose is partly broken away as if it had once held a ring. A perforated knob has occupied the top of the forehead as in the other examples. The face is coated with a light yellowish-gray wash, and the remainder of the surface is red.

Four additional examples of the death's head vases are shown in plate XXXII. They present varied characteristics in detail, but all correspond closely in the more important features of form and expression.

TOBACCO PIPES

In the East and Northeast the clay tobacco pipes of the aborigines were often superior in execution, design, and decoration to the ordinary utensils of clay associated with them. In the central and southwestern sections pipes were for the most part remarkably rude and without grace of outline, and generally without embellishment, while

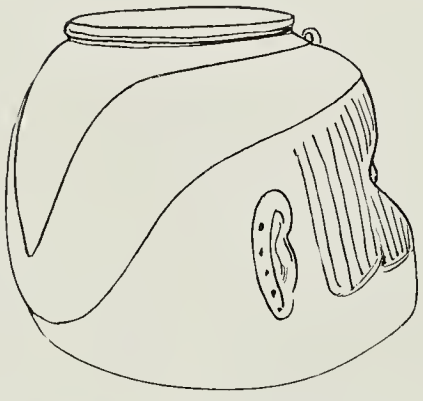


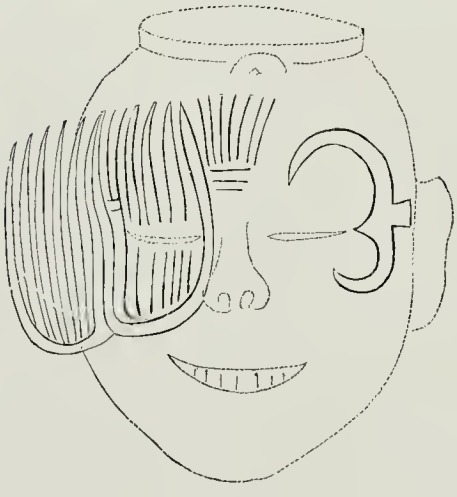
a (ARKANSAS, HEIGHT 5 INCHES)



b (ARKANSAS, HEIGHT 6¼ INCHES)



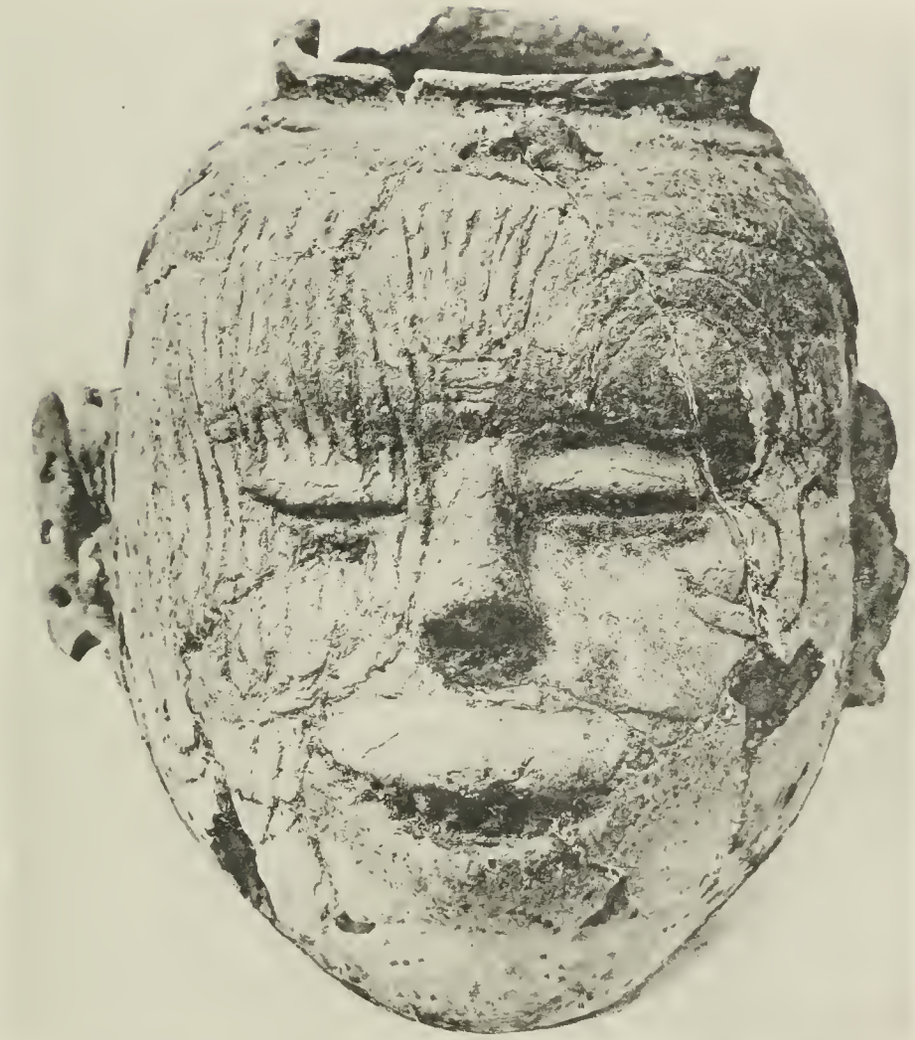




c (ARKANSAS, DAVENPORT ACADEMY COLLECTION, HEIGHT 6¾ INCHES)

VESSELS IMITATING THE HUMAN HEAD

MIDDLE MISSISSIPPI VALLEY GROUP





VESSEL IMITATING THE HUMAN HEAD (ARKANSAS)

MIDDLE MISSISSIPPI VALLEY GROUP

(HEIGHT 6¼ INCHES)

HELIOTYPE CO., BOSTON.





VESSEL IMITATING THE HUMAN HEAD, ARKANSAS

MIDDLE MISSISSIPPI VALLEY GROUP

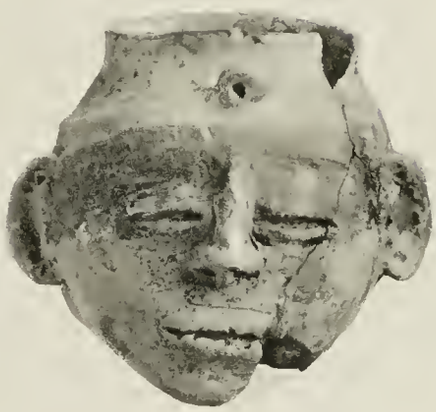
(HEIGHT $6\frac{1}{8}$ INCHES)



a (HEIGHT 6¾ INCHES)



b (HEIGHT 4⅝ INCHES)



c (HEIGHT 4 INCHES)

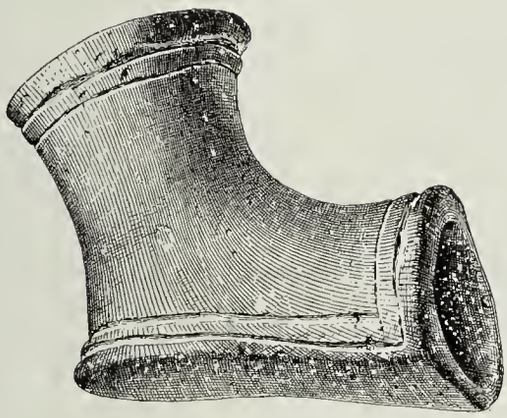


d (HEIGHT 5¼ INCHES)

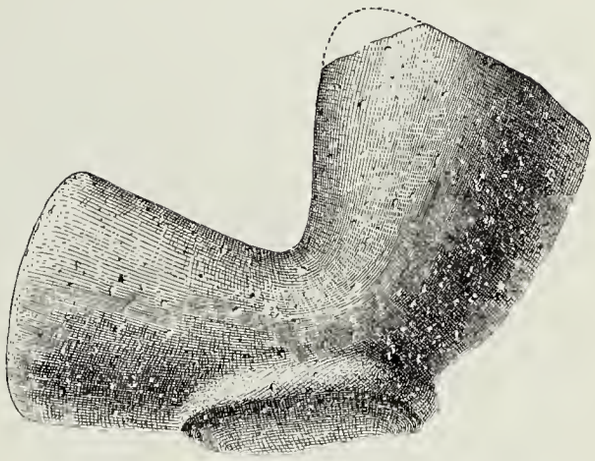
VESSELS IMITATING THE HUMAN HEAD, (ARKANSAS)

MIDDLE MISSISSIPPI VALLEY GROUP

HELIOTYPE CO., BOSTON.



a (ARKANSAS, MOOREHEAD COLLECTION, LENGTH OF BASE 2¼ INCHES)



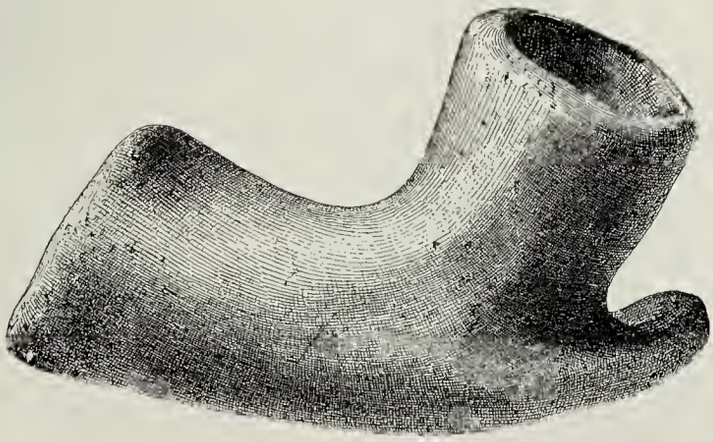
b (ARKANSAS, LENGTH OF BASE 2½ INCHES)



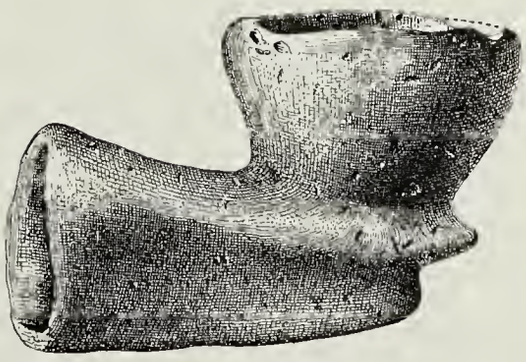
c (ARKANSAS, LENGTH OF BASE 2¾ INCHES)



d (ARKANSAS, LENGTH OF BASE 2¾ INCHES)



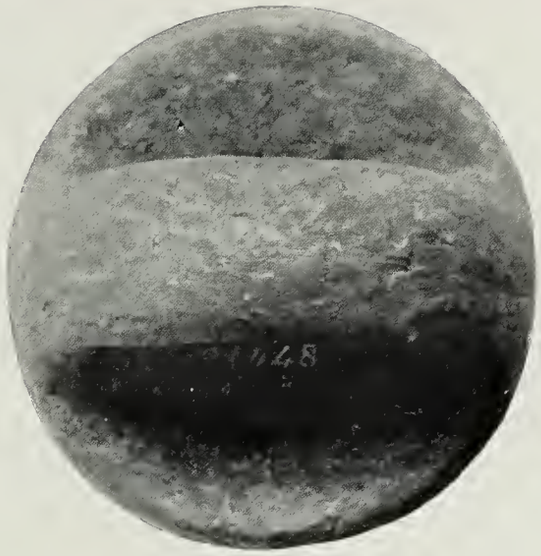
e (ARKANSAS, LENGTH OF BASE 4¼ INCHES)



f (ARKANSAS, LENGTH OF BASE 2⅝ INCHES)

TOBACCO PIPES

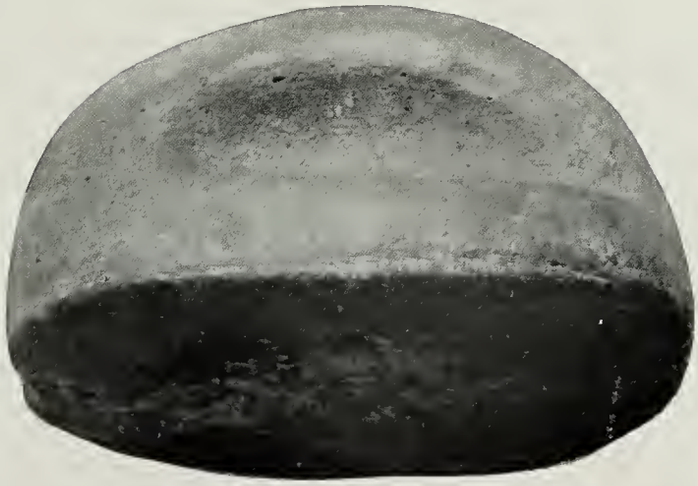
MIDDLE MISSISSIPPI VALLEY GROUP



a (KENTUCKY, DIAMETER 4¾ INCHES)



b (TENNESSEE, DIAMETER 4¾ INCHES)



c (TENNESSEE, LENGTH 6 INCHES)

TROWELS OR MODELING IMPLEMENTS

MIDDLE MISSISSIPPI VALLEY GROUP

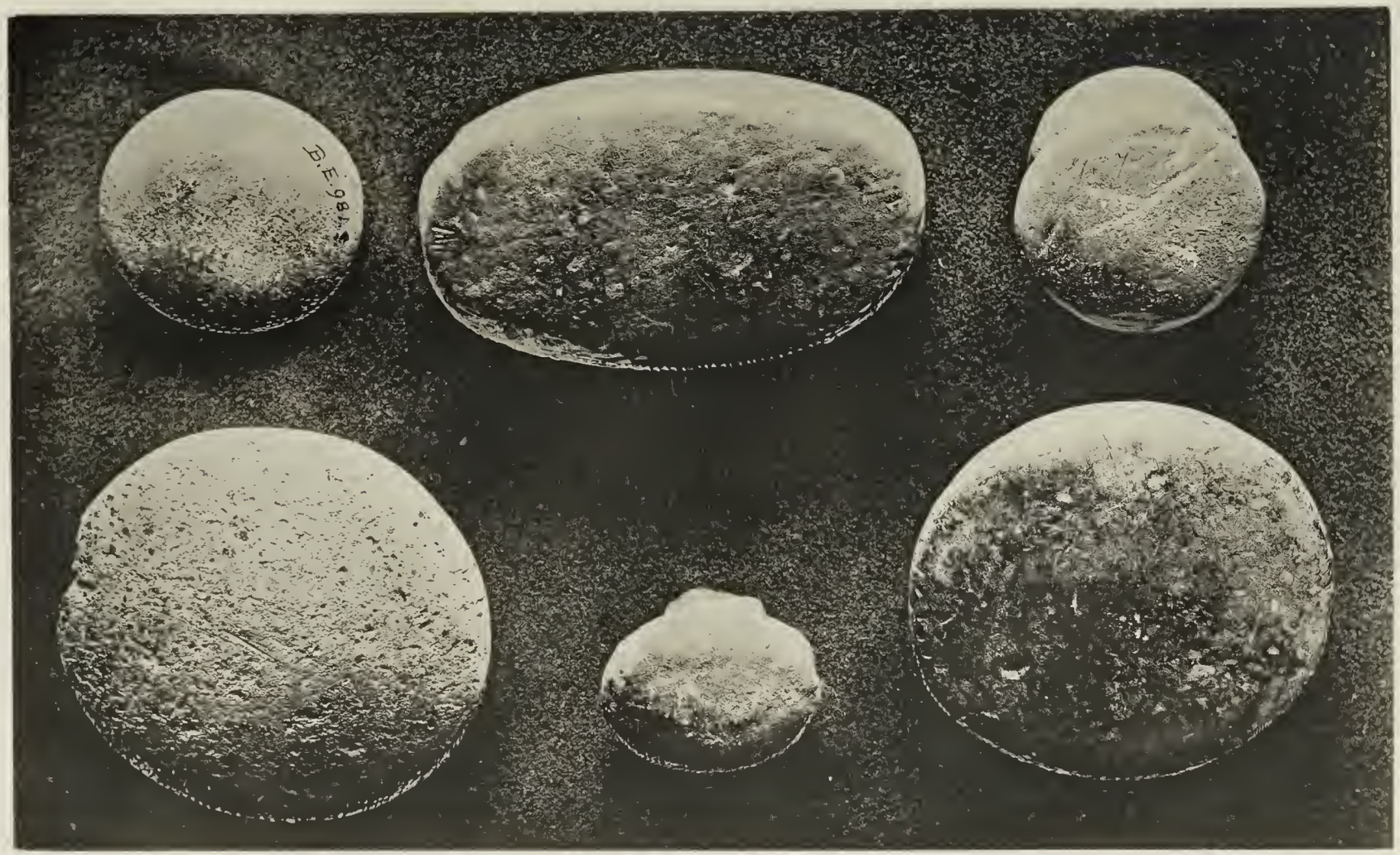


MODELING IMPLEMENTS

MIDDLE MISSISSIPPI VALLEY GROUP

(ONE-HALF)

HELIOTYPE CO., BOSTON.



CONVEX SURFACES OF TROWELS AND MODELING IMPLEMENTS

MIDDLE MISSISSIPPI VALLEY GROUP

(ABOUT ONE-HALF)

tne earthenware of the same territory was well made and exhibits pronounced indications of esthetic appreciation on the part of the potters.

A number of the pipes of the middle Mississippi province are illustrated in plate XXXIII. Generally they are made of the same admixtures of clay and pulverized shell as are the assoeiated vessels. The eolors are the ordinary dark and yellowish-gray shades of the baked clay. Traees of blackening by use are observed, and the bowls in a few instanees are still partly filled with the compacted black ash left presumably by the native smoker. The shapes are simple, being as a rule slight modifications of a heavy bent tube somewhat constricted at the elbow and expanding toward the ends. Both openings are large and eonie and are often nearly equal in capacity and closely alike in shape.

Without modifieation of the fundamental outlines, many varieties of shape were produeed, the most common being a flattening of the base as though to permit the bowl to rest steadily on the ground while the smoking was going on, probably through a long tube or stem. This flattening is in many cases accompanied by an expansion at the margins, as in plate XXXIII *a*, *b*, or by a flattish projeetion beyond the elbow, as in *e*. Oeeasionally the shape is elaborated to suggest rudely the form of some animal, the projection at the elbow being divided and rounded off as though to represent the knees of a kneeling figure, and in rare cases various features of men or other creatures are more fully brought out. In one instance the projection at the elbow beeomes an animal head, in another medallion-like heads are set on around the upper part of the bowl. In *a* and *c* incised figures have been executed in a rather rude way, the motives corresponding with those found on the earthen vessels of the same region. The specimen shown in *a* was lent by Mr Warren K. Moorehead. Other variations of the type are illustrated in MeGuire's Pipes and Smoking Customs, pp. 530–535. Typical as well as variously modified forms of this variety of pipe are found in Tennessee. Alabama, Georgia. Florida, and, more rarely, in other states.[a]

MISCELLANEOUS ARTICLES

The art of the modeler was directed in the main toward the making and embellishing of vessels, yet solid figurines of men and animals and heads of men, mostly small and rude as though merely toys or funeral offerings, are now and then secured by collectors. Speeimens are illustrated in the introduction and in conneetion with various groups of ware.

In plates XXXIV and XXXV several artieles are brought together to illustrate the use of clay in the manufacture of implements, personal ornaments, and articles of unknown or problematic use or signifieance. The specimens shown in plate XXXIV represent a rather rare variety of

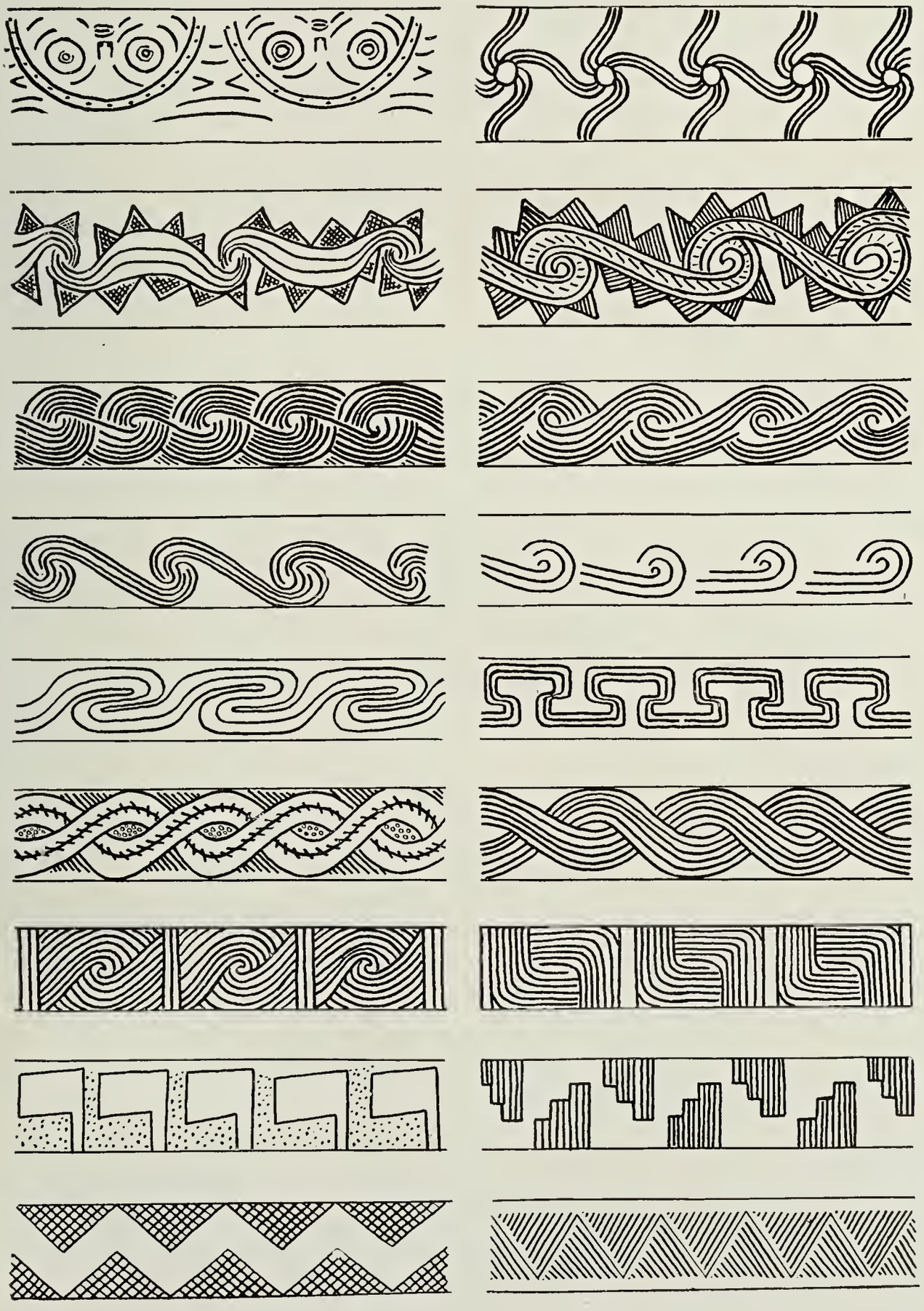
[a] For southern pipes see the various papers of Clarence B. Moore.

implement, already described in the introduction. They seem to be adapted to use as trowels or finishing tools for plastered walls or floors. They are found mainly in Tennessee. The discoidal smoothing surface shows generally a decided polishing by use, and the looped handle is manifestly intended for grasping, in the manner of a common smoothing iron. These implements could have served, however, in the modeling of large earthenware vessels, or as crushers or pulverizers of foods or paints. Illustrations of a large class of stopper-like or mushroom-shaped forms that may have been used as modeling or smoothing tools in pottery making, as indicated in the introductory section, are included in plate XXXV. That the functions of these objects and those given in the preceding plate are similar or identical is indicated by the character of the convex polishing surface shown in plate XXXVI. Illustrations of earthenware earrings, labrets, a small rattle and the pellets derived from it are given in the introduction.

DECORATIVE DESIGNS

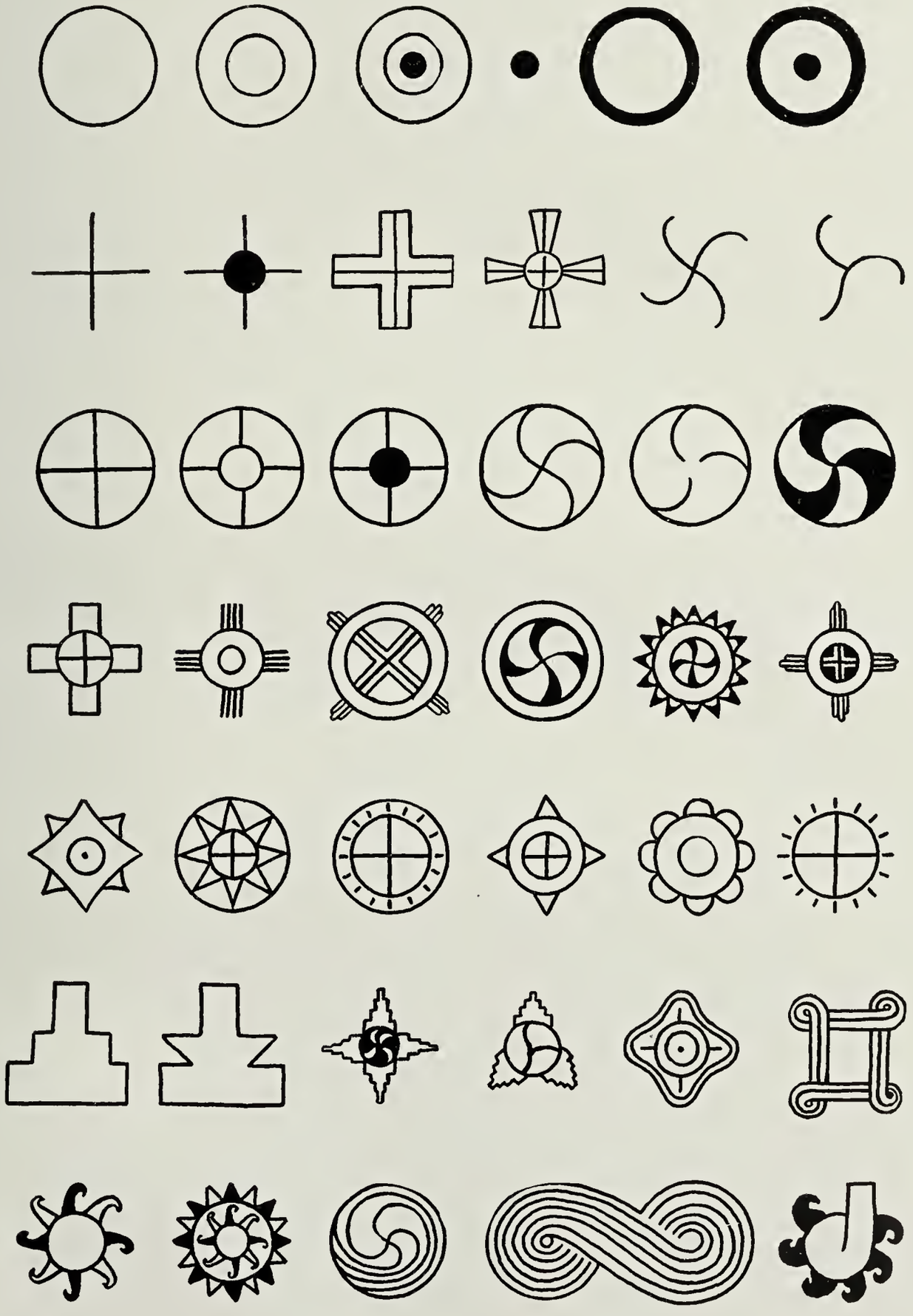
Plate XXXVII is introduced for the purpose of conveying an idea of the character and range of the decorative designs most usual in this region. Many of the more elementary forms are omitted. The more elaborate meanders, twined designs, and scrolls are incised. Another group of designs, embodying many symbolic devices, is given in plate XXXVIII. These are executed usually in red and white paint.

From the beginning of my rather disconnected studies of the ornamental art of the native tribes, I have taken the view that, as a rule, the delineative devices employed were symbolic; that they were not primarily esthetic in function, but had a more serious significance to the people using them. When vases were to be devoted to certain ceremonial ends, particular forms were made and designs were added because they had some definite relation to the uses of the vessels and were believed to add to their efficacy. The studies of Dr J. Owen Dorsey, Mr Cushing, Mrs Stevenson, Miss Fletcher, Dr Fewkes, and others have little by little lifted the veil of uncertainty from the whole group of aboriginal delineative phenomena, and the literal significance and function of a multitude of the designs are now known. We thus learn that the devices and delineations on the Mississippi valley pottery are symbols derived from mythology. Stellar and lobed figures and circles probably represent the stars, the sun, or the horizon circle. The cross, the various forms of volutes and scrolls, and the stepped figures represent the four winds, the clouds, and rain; and the reptiles, quadrupeds, birds, men, and monsters are connected with the same group of phenomena. The vessels marked with these figures were no doubt devoted to particular functions in the ceremonial activities of the people. Plate XXXVII presents a series of the purely formal designs. Speculation as to the significance of particular forms of these figures is probably



DECORATIVE DESIGNS

MIDDLE MISSISSIPPI VALLEY GROUP



DECORATIVE DESIGNS

MIDDLE MISSISSIPPI VALLEY GROUP



/ (HEIGHT 6½ INCHES)



/ (HEIGHT 10⅛ INCHES)

EARTHEN VESSELS FINISHED IN COLOR

MIDDLE MISSISSIPPI VALLEY



a (HEIGHT 11½ INCHES)



b (LENGTH 11½ INCHES)

EARTHEN VESSELS FINISHED IN COLOR

MIDDLE MISSISSIPPI VALLEY



11 (HEIGHT 11 INCHES)



10 (HEIGHT 10 INCHES)

EARTHEN VESSELS FINISHED IN COLOR

MIDDLE MISSISSIPPI VALLEY



b (ARKANSAS, HEIGHT 6 INCHES)



a (ARKANSAS, HEIGHT 4 INCHES)



c (ARKANSAS, HEIGHT 6 INCHES)



d (MISSOURI, HEIGHT 8⅛ INCHES)

EARTHEN VESSELS FINISHED IN COLOR

MIDDLE MISSISSIPPI VALLEY



a (HEIGHT 6 INCHES)



b (HEIGHT 6¾ INCHES)

EARTHEN VESSELS FINISHED IN COLOR

MIDDLE MISSISSIPPI VALLEY



EARTHENWARE OF TENNESSEE

MIDDLE MISSISSIPPI VALLEY GROUP

(THRUSTON COLLECTION)



EARTHENWARE OF TENNESSEE

MIDDLE MISSISSIPPI VALLEY GROUP

(THRUSTON COLLECTION)



EARTHENWARE OF TENNESSEE

MIDDLE MISSISSIPPI VALLEY GROUP

(THRUSTON COLLECTION)



EARTHENWARE OF TENNESSEE

MIDDLE MISSISSIPPI VALLEY GROUP

(THRUSTON COLLECTION)



EARTHENWARE OF TENNESSEE

MIDDLE MISSISSIPPI VALLEY GROUP

(THRUSTON COLLECTION)



EARTHENWARE OF TENNESSEE

MIDDLE MISSISSIPPI VALLEY GROUP

(THRUSTON COLLECTION)



EARTHENWARE OF TENNESSEE

MIDDLE MISSISSIPPI VALLEY GROUP

(THRUSTON COLLECTION)

quite unnecessary, since the general nature of all is so well understood. Definite explanations must come from a study of the present people and usages, and among the Mississippi valley tribes there are no doubt many direct survivals of the ancient forms. Mr C. C. Willoughby has discussed this topic at length in a paper published in the Journal of American Folk-Lore. The same region furnishes many similar symbols engraved on shell, bone, and stone.

PAINTED VASES

Several specimens, selected to illustrate the interesting color treatment so characteristic of this group of pottery, are presented in plates XXXIX, XL, XLI, XLII, and XLIII. The flattish bottle, plate XXXIX *a*, is by no means as handsome or elaborate in its designs as are others in our collections, but it serves quite well to illustrate the class. The red color of the spaces and figures is applied over the light yellowish ground of the paste and is carefully polished down. The specimens reproduced in plates XL, XLI, and XLII have been referred to and sufficiently described in preceding pages. An exceptionally fine example of the colored human figure is given in plate XXXIX *b*. Parts of the head and body are finished in red, other parts and the necklace are in white, while certain spaces show the original yellowish gray color of the paste.

POTTERY OF TENNESSEE

I am so fortunate as to be able to add a number of plates (XLIV, XLV, XLVI, XLVII, XLVIII, XLIX, and L) illustrating the wares of the Cumberland valley, Tennessee, and especially of the Nashville district. These plates appeared first in Thruston's Antiquities of Tennessee, and I am greatly indebted to this author for the privilege of reproducing them here.

POTTERY OF THE LOWER MISSISSIPPI VALLEY

Archeologic investigation has not extended into the central southern states save in a few widely separated localities, and enough material has not been collected to permit a full and connected study of the primitive art of the province. It would seem from present information that the region of the lower Mississippi is not so rich in fictile products as are many other sections; at any rate our museums and collections are not well supplied with material from this part of the South, and literature furnishes but brief references to the practice of the ceramic art (see Introduction). Some fugitive relics have come into the possession of museums, and on these we must mainly rely for our present knowledge of the subject. Much of the earthenware appears to be nearly identical with, or closely allied to, that of the middle Mississippi region, as well as with that of the Gulf coast farther east.

A large series of the vases from Louisiana and Texas would, if they were brought together, undoubtedly yield many points of interest with respect to the influence of Mexican and Pueblo art on that of this province. Such a series would also be of much value in connection with the history of the various tribes occupying the valley when it was first visited by the French. Du Pratz and Butel-Dumont have left us brief but valuable records of the practice of the art in this section, but we are not definitely informed which of the various peoples were referred to in their accounts. In those days no distinction was made between the linguistic families, although Natchesan, Tonikan, Caddoan, Muskhogean, and Siouan peoples were encountered. So far as the evidence furnished by the collections goes, there is but one variety of the higher grade of products. Citations regarding the practice of the art in this province have been made under the head Manufacture, and need not be repeated here.



FIG. 52—Bowl made by Choctaw Indians about 1860 (diameter 9¼ inches).

The only specimen of recent work from this province which is preserved in the national collections is a blackish bowl, well polished and ornamented with a zone of incised lines encircling the body. It is illustrated in figure 52. The record shows that it was made by the Choctaw Indians at Covington, St Tammany parish, Louisiana, about the year 1860. It is said that the art is still practiced to a limited extent by these people.

The highest types of vases from Louisiana and Mississippi have but slight advantage over the best wares of the St Francis and Cumberland valleys. The simpler culinary wares are much the same from St Louis to New Orleans. Some localities near the Gulf furnish sherds of pottery as primitive as anything in the country, and this is consistent with the early observations of the condition of the natives. The Natchez and other tribes were well advanced in many of the arts, while numerous tribes appear to have been, at times at least, poverty-stricken wanderers without art or industry worthy of mention. It is possible that the primitive forms of ware found on some of these



a



b



c (MISSISSIPPI, DAVENPORT ACADEMY COLLECTION, ONE-THIRD)



e (LOUISIANA, DIAMETER 5 INCHES)



d (LOUISIANA, HEIGHT 6½ INCHES)

VASES WITH INCISED DESIGNS

LOWER MISSISSIPPI VALLEY GROUP



a (LOUISIANA, HEIGHT 4½ INCHES)



b (MISSISSIPPI, HEIGHT 4 INCHES)



c (MISSISSIPPI, DIAMETER 6 INCHES)



d (MISSISSIPPI, HEIGHT 6 INCHES)

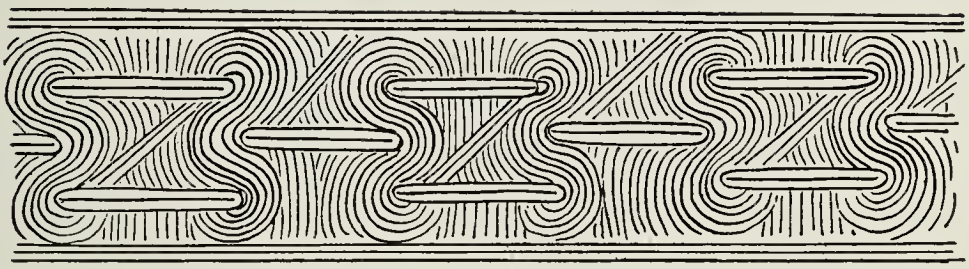


e (MISSISSIPPI, HEIGHT 4¾ INCHES)

VASES WITH INCISED DESIGNS

LOWER MISSISSIPPI VALLEY GROUP

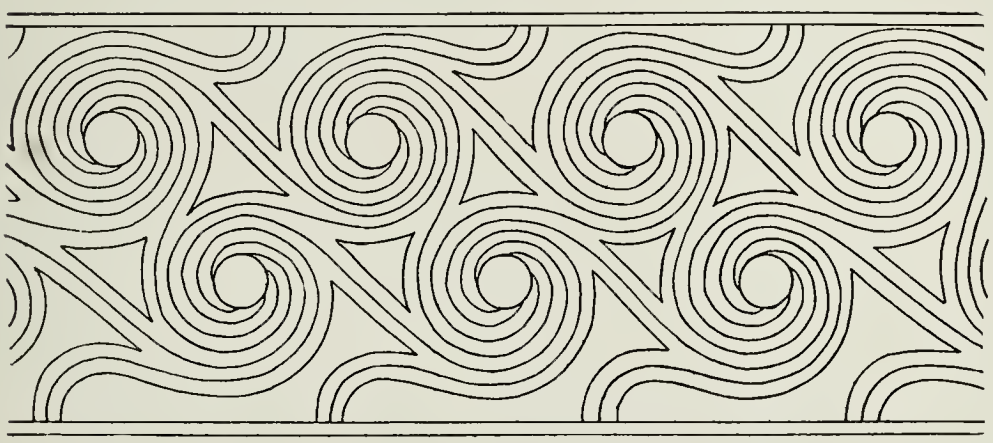
HELIOTYPE CO., BOSTON.



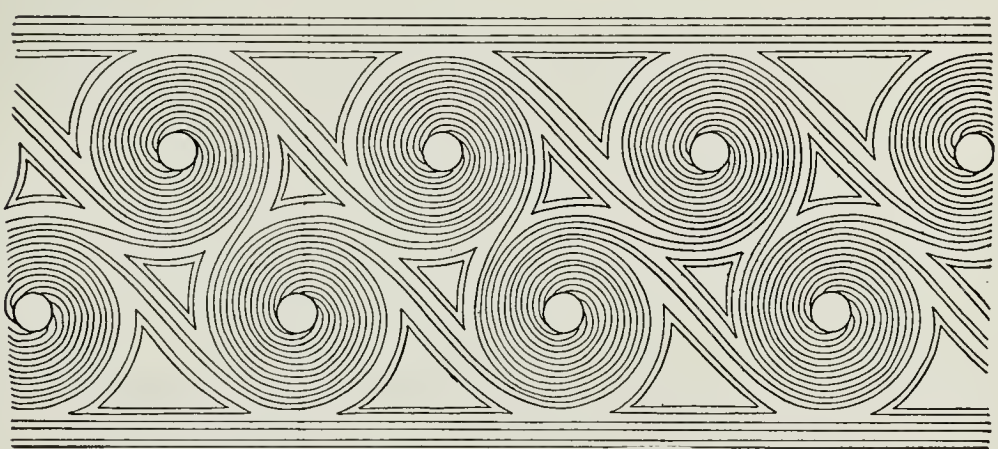
a



b



c



d

INCISED DESIGNS FROM VASES SHOWN IN PLATES LI AND LII

LOWER MISSISSIPPI VALLEY GROUP

southern sites may represent the art of the archaic ancestors of the more advanced peoples of the valley, but at present we seem to have no means of settling such a point. It is well known, however, that single communities produced at the same time a wide range of ware, the style, material, shape, and finish depending on the uses of the vessels or on the haste with which they were prepared. At Troyville, Catahoula county, Louisiana, for example, a mound examined by agents of the Bureau of Ethnology yielded almost every variety and grade of ware known in the South and Southwest, including coarse shell-tempered ware, silicious ware, fine argillaceous ware, stamped ware, red ware, fabric-marked ware, and incised ware.

Of great interest, on account of the perfection of its finish, is a variety of pottery found in graves and mounds on the lower Mississippi and on Red river. Daniel Wilson published a cut representing some typical specimens of this ware from Lake Washington, Washington county, Mississippi.[a] Several years ago a number of fine examples of the same ware, labeled "Galtneys," were lent to the National Museum by the Louisiana State Seminary at Baton Rouge. Photographs of some of these vessels were kept, but the Curator made no definite record of their origin or ownership. A small number of pieces of the same ware are to be found in the various collections of the country, notably in the Free Museum of Science and Art, Philadelphia.

The most striking characteristics of the better examples of this ware are the black color and the mechanical perfection of construction, surface finish, and decoration. The forms are varied and symmetric. The black surface is highly polished and is usually decorated with incised patterns. The scroll was the favorite decorative design, and it will be difficult to find in any part of the world a more chaste and elaborate treatment of this motive. In plate LI *a* a photograph of a small globular vase or bottle marked "Galtneys" is reproduced. The design is engraved with great precision in deep, even lines, and covers nearly the entire surface of the vase; it consists of a double row of volutes (plate LII *d*) linked together in an intricate and charming arrangement, corresponding closely to fine examples from Mycene and Egypt. A skilled draftsman would find the task of executing this design with equal precision on a plane surface extremely trying, and we can but marvel at the skill of the potter who could produce it, properly spaced and connected in every particular, on the surface of the globular vase. Farther up the Mississippi there are examples embodying the same conception of compound volutes, but the combinations are much less complex and masterly.

In plate LI four other vases, all presumably of this group, have been brought together. They do not differ widely from the pottery of the

[a] Wilson, Daniel, Prehistoric man, London, 1862, vol. II, pp. 21–22.

St Francis river region, and may be regarded, it seems to me, as exceptional examples of the same general group of ware. The little bottle *e* contains a rather rudely engraved figure of an eagle, the head appearing on one side, and the tail, pointed upward, on the other. The particular locality from which the bottle came is not known. Ware closely related to the Middle and Lower Mississippi pottery is found in Texas, but its limitations on the west are not yet defined. Examples of the more elaborate incised designs belonging to this group of ware are brought together in plate LIII.

The vessels illustrated in plate LII are now preserved in the Museum of Science and Art in Philadelphia, and were kindly placed at my disposal by Dr Stewart Culin, of that museum. They form part of the Dickerson collection recently acquired and reported on by Dr Culin.[a] It is noteworthy that the designs engraved on these vases bear a striking resemblance to the scroll work of the middle Mississippi valley on the north and of the Gulf coast farther east, and it is to be expected that these designs will be found to affiliate closely with Mexican work, as do the forms of many of the vessels.

POTTERY OF THE GULF COAST

Occurrence

Along the Gulf coast east of the delta of the Mississippi pottery is found in many localities and under varying conditions. The features most characteristic of the wares of the West recur with decreasing frequency and under less typical forms until Florida is reached. Features typical of Appalachian and Floridian wares make their appearance east of Pensacola bay.

The manner of occurrence of the ceramic remains of the Gulf region is interesting. In many cases several varieties of ware are intermingled on a single site. This is especially true of some of the kitchen-midden and shell-mound sites, which, it would seem, must have been the resort of different tribes, and even of distinct linguistic families, who visited the tide-water shores from time to time in search of shellfish. In the mounds, however, the conditions are simpler, and in cases we seem to have the exclusive product of a single people. This simplicity in the burial pottery may be due to the fact that only particular forms of ware were used for mortuary purposes. With some peoples, as has been already noted, certain kinds of vessels were devoted exclusively to culinary uses. Remains of the latter utensils will be found very generally in shell deposits, and it is in these deposits and not in the mounds that we would expect to find the wares of non-resident communities.

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[a] Culin, Stewart, Bulletin of the Department of Archæology and Paleontology, University of Pennsylvania, vol. II, number 3.

Speculation as to the peoples to whom these wares should be attributed will for the present be practically unavailing. It is probable that the Muskhogean tribes occupied the coast rather fully between the delta of the Mississippi and Tampa bay, but several linguistic stocks must have had access to this important source of food supply. Even the Siouan family was represented (by the ancestors of the Biloxi of to-day), and it is not impossible that some of the ware, especially that embodying animal figures, may be due to the presence or influence of this people. Strangely enough, in the national collections from southwestern Alabama there is a lot of sherds exhibiting typical features of the peculiar pottery of New York state, which seems to belong to the Iroquoian tribes. It is possible, however, that the Museum record may be defective and that the association is accidental.

Mobile-Pensacola Ware

The leading group of ware found along the great northern curve of the Gulf coast is well represented by the contents of mounds situated on Mobile, Perdido, Pensacola, and Choctawhatchee bays. The National Museum has a large series of vessels from a mound on Perdido bay, obtained by Francis H. Parsons and other members of the United States Coast and Geodetic Survey about the year 1889. Recent explorations conducted by Clarence B. Moore at several points along the tidewater shores of the Gulf have supplied a wonderful series of vases now preserved in the Museum of the Academy of Natural Sciences, Philadelphia. These collections have been very generously placed at my disposal by Mr Moore, and as they belong in the main to the same ceramic group with the Parsons finds, all will be presented together. The range of form in this group is quite wide, but not equal to that in the pottery of the Arkansas region. If the collections were equally complete from the two regions, this relation might be changed, yet it is still apparent that the western ware has the advantage in a number of essentials. In the Mobile-Pensacola district few traces of painted vessels have been found, and there is apparently less symmetry of outline and less refinement of finish than in the best products of the West. There are cups, bowls, shallow and deep pots, and a few bottles, besides a number of compound and eccentric forms, but the deep pot, the tripod vase, and the slender-necked bottles are practically absent. Such pots as occur show, as they do in the West, indications of use over fire, and it is worthy of remark that some of them correspond to western cooking vessels in being provided with handles and in having bands of crude ornamentation incised or relieved about the rim and neck, while others, occurring always in fragments, approach the eastern type, which is without handles and is characterized by an oblong body, somewhat conic below, and by stamp-finished surfaces.

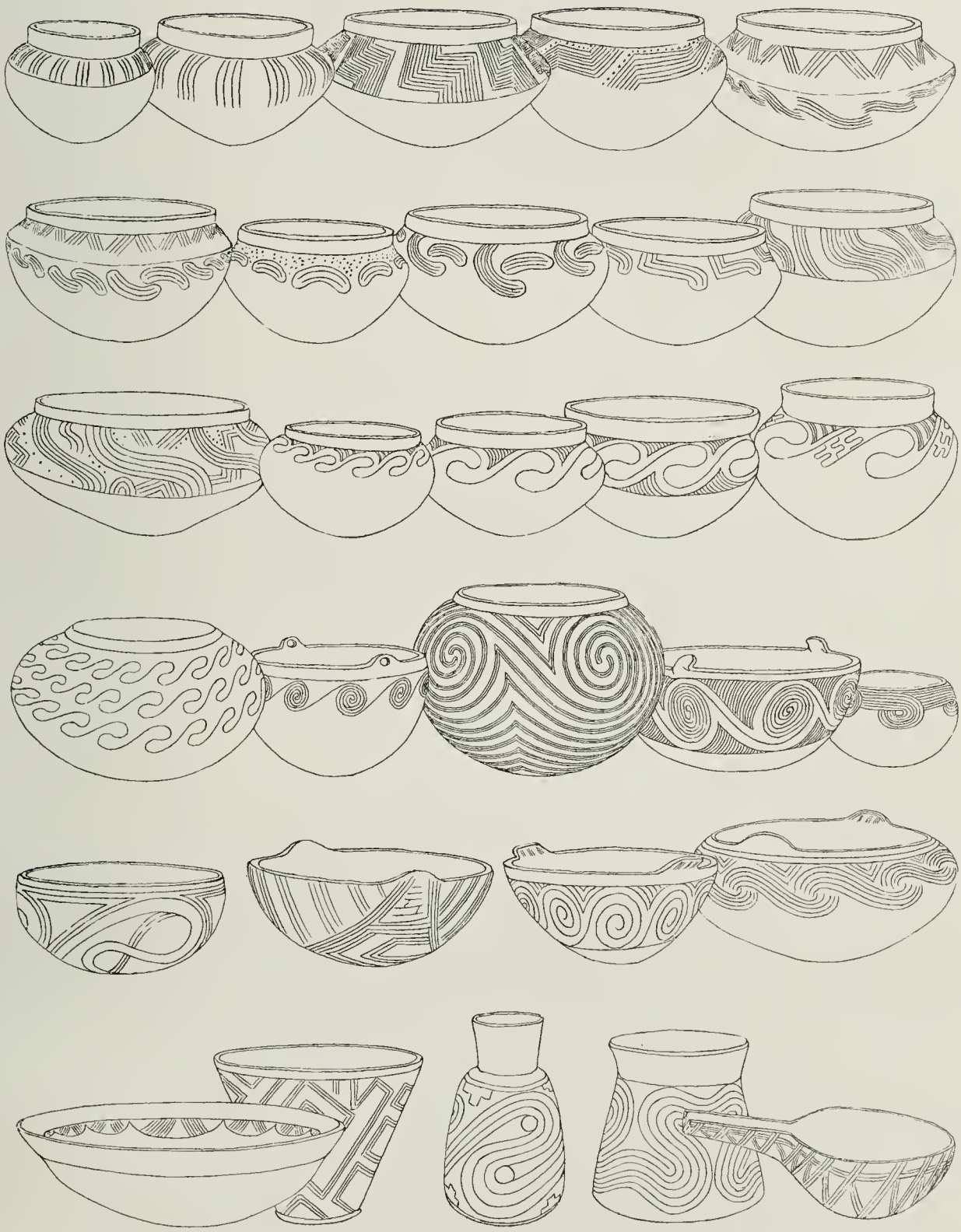
The paste is fine and silicious, with but little distinguishable tempering: its colors are yellowish or brownish grays, rarely approaching black, and the surface is even, though seldom very highly polished. The walls are thin and of uniform thickness. Animals and animal features modeled in relief and in the round are attached to the vases or enter into their form in much the same manner as in the West, but with less frequency and freedom. They have, however, perhaps a greater interest on account of the peculiar and very definite correlation of the incised designs on the vases with the modeled life forms. This subject will receive attention separately farther on. The pottery is nearly all obtained from burial mounds, and it is observed that the vases in most, if not all, cases have been perforated or broken before consignment to the graves. This custom extended eastward through Georgia and Florida to the Atlantic coast, but it was practically unknown in the North and West.

The Parsons collection of pottery was obtained from a sand mound on Bear point, Alabama. Nearly all the pieces were broken, but otherwise they were so well preserved that many have been restored to much their original appearance under my supervision. Illustrations of a large number of the simpler forms are given in plate LIV.

From shallow bowls we pass to deeper forms and to globular vessels. A few specimens are cylindric, and occasionaly a wide-mouthed bottle is encountered. One specimen has a handle and resembles a ladle in form. The outlines are generally gracefnl, the walls thin, and the rims inconspicuous and neat. The incised designs are lightly and freely drawn, and include a wide range of formal figures, from simple groups of straight lines to widely diversified forms of meanders and scrolls. Life-form elements, often obscure, appear in numerous cases.

In plate LV three of the large bowls are presented. These exhibit characteristic varieties of form, and all are embellished with incised designs embodying life elements which are referred to later on in this section. Plate LVI *a* is a neat little jar with incised meander and step design from the Bear Point mound. It is also shown in outline in plate LIV. In *b* is introduced a bottle of northern type from Franklin county, Mississippi. It is of special interest, since it contains a painted design, *c*, embodying the most prevalent Gulf Coast life-form device, and is, at the same time, nearly duplicated by a similar bottle from near Nashville, Tennessee, illustrated by Thruston in his work, figure 40. Part of plate LVI and plates LVII, LVIII, and LIX are devoted to the presentation of life forms.

A rather remarkable piece, resembling middle Mississippi forms, is illustrated in plate LVI *d*. The head of a bird, probably intended for an owl, forms the apex of a full-bodied bottle, the funnel-shaped open-



VASES FROM A MOUND ON PERDIDO BAY

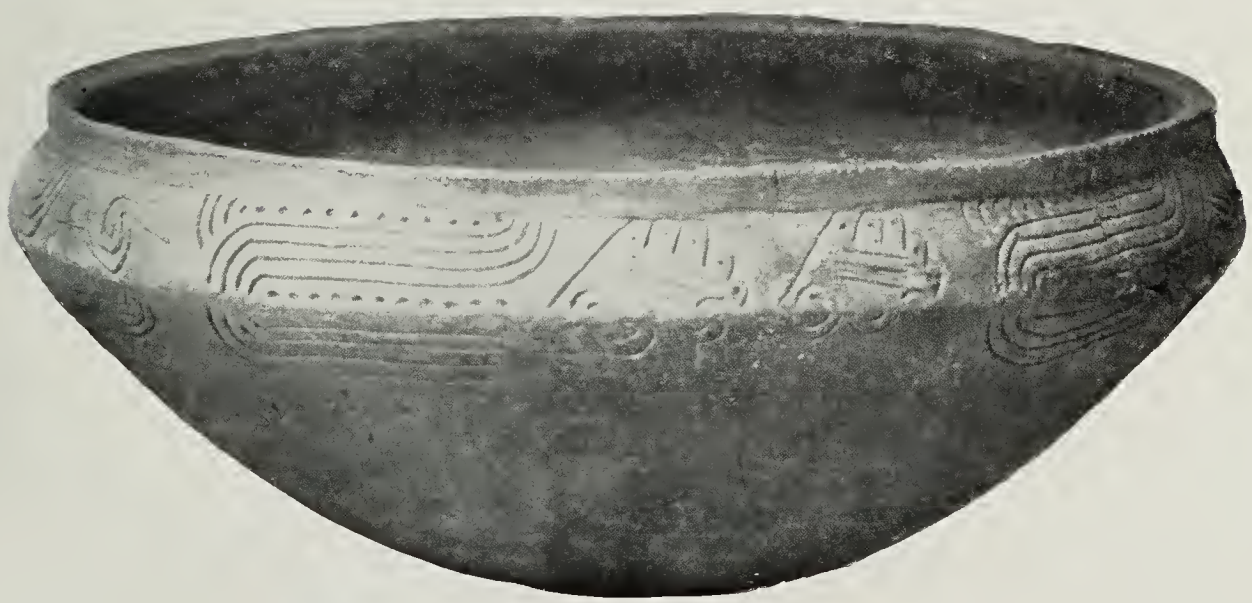
GULF COAST GROUP



a (GEORGIA, DIAMETER 13¼ INCHES)



b (ALABAMA, DIAMETER 8 INCHES)



c (ALABAMA, DIAMETER 19 INCHES)

LARGE BOWLS WITH INCISED DESIGNS

GULF COAST GROUP



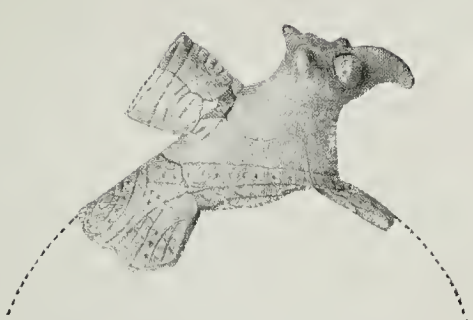
a (ALABAMA, HEIGHT 4¾ INCHES)



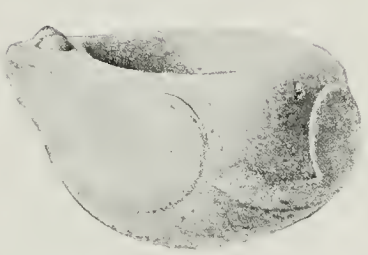
b (MISSISSIPPI, HEIGHT 8 INCHES)



c



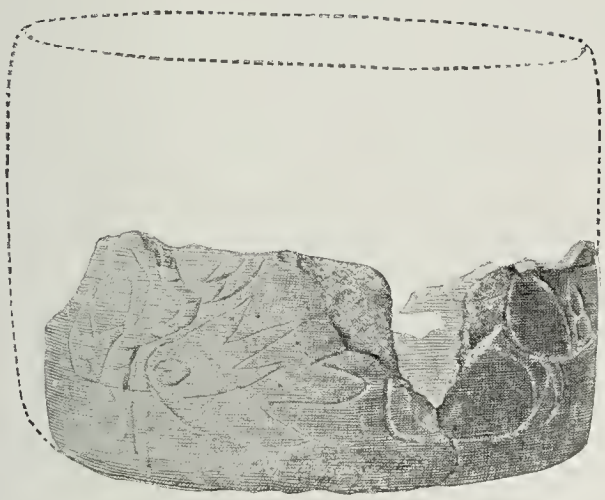
d (ALABAMA, DIAMETER 6 INCHES)



e (ALABAMA, DIAMETER 3 INCHES)

VASES VARIOUSLY DECORATED

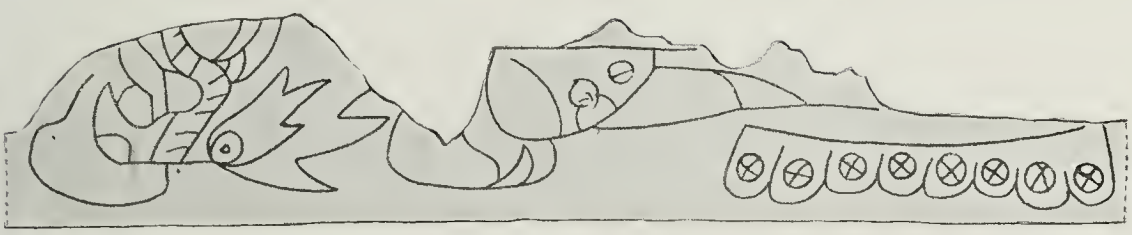
GULF COAST GROUP



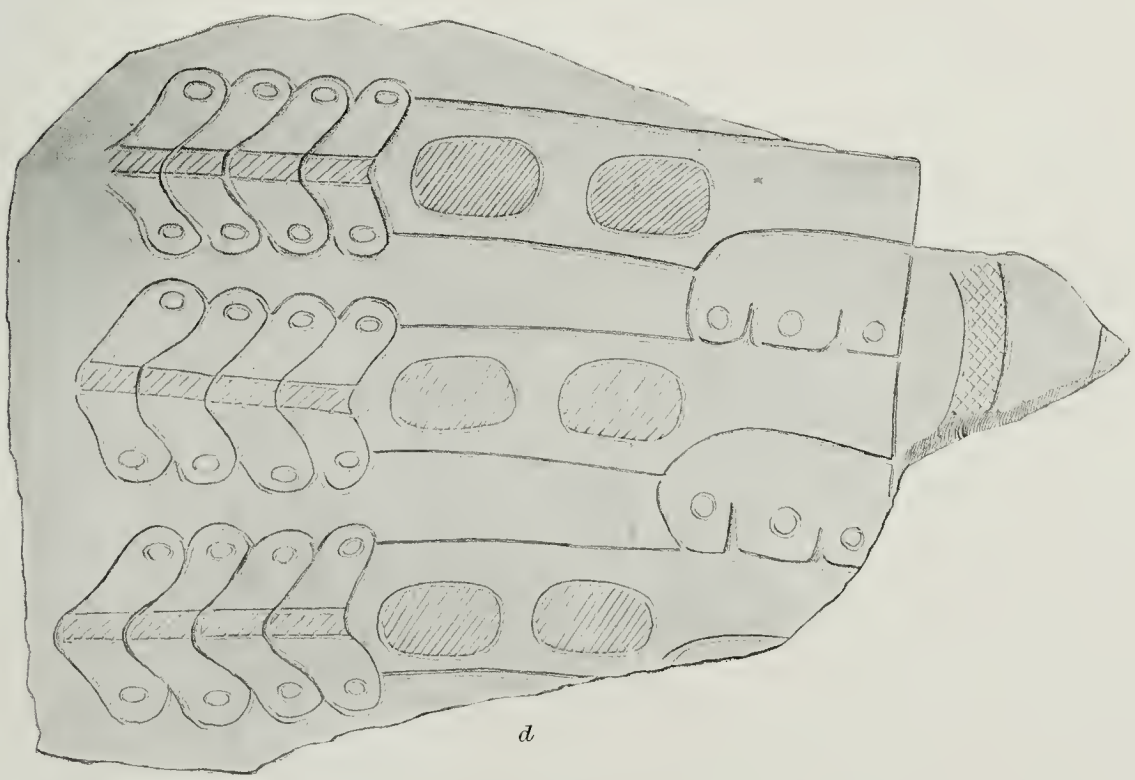
a



b



c



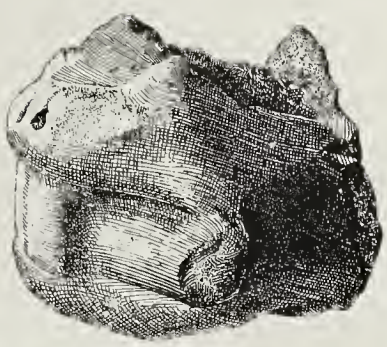
d

VASES WITH ENGRAVED FIGURES OF BIRDS AND SERPENTS, ALABAMA

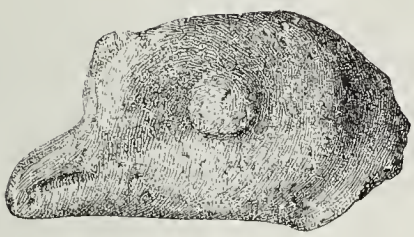
GULF COAST GROUP



a



b



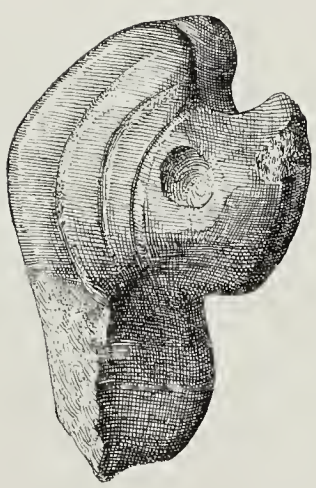
c



d



e



f

HEADS OF BIRDS AND ANIMALS USED AS VASE ORNAMENTS, ALABAMA

GULF COAST GROUP



a (HEIGHT 3⅛ INCHES)



b (HEIGHT 4¼ INCHES)



c (HEIGHT 3⅜ INCHES)



d (HEIGHT 4⅛ INCHES)

HEADS OF MEN AND BIRD USED AS VASE ORNAMENTS, ALABAMA

GULF COAST GROUP



a (DIAMETER 11½ INCHES)



b (DIAMETER 5¼ INCHES)



c (DIAMETER 11¾ INCHES)

VASES WITH INCISED DESIGNS, ALABAMA

GULF COAST GROUP

(MOORE COLLECTION)



a (ALABAMA, MOORE COLLECTION, DIAMETER 13 INCHES)



b (FLORIDA, MOORE COLLECTION, HEIGHT 6 INCHES)



c (FLORIDA, MOORE COLLECTION, DIAMETER 14 INCHES).

VASES WITH INCISED DESIGNS

GULF COAST GROUP

ing being placed at the back of the neck. The wings and other features of the body appear to have been depicted in incised lines. The little vase shown in plate LVI *e*, from the Bear Point mound, is cleverly modeled to represent a frog, and shows close analogies with the Mississippi valley work.

The builders of the sand mounds on Perdido bay seem occasionally to have executed very elaborate engravings of eagles and serpents on cylindric cups, which probably served as ceremonial drinking vessels; illustrations are given in plate LVII. The first figure, *a*, represents the base of a cup which is encircled by the engraving of an eagle; the second figure, *b*, represents a fragment of a handsome cup of similar shape, and serves to indicate the relation of the figure of the bird to the rim of the cup. Part of the tail, talons, and wing are shown. In *c* we have all that remains of the design on the cup *a* projected at full length. The strange figure illustrated in *d* was obtained from much shattered fragments of a well-made and neatly finished cup of cylindric shape. It seems to represent the tails of three rattlesnakes, the lines joined at the right as if to represent a single body.

In plate LVIII *a*, *b*, *c*, *d*, and *e*, we have examples of the modeling of heads of birds and other creatures for bowl embellishments. The treatment closely resembles that seen in more western work. Here, as in the Mississippi country, the duck is a favorite subject. In *f* we have a grotesque creature common in the art of the West. An eagle is well shown in *e*, and what appears to be the head of a serpent or turtle with a stick in its mouth is given in *b*. This feature appears in the wares of Tennessee and Arkansas, the animal imitated being a beaver. Additional specimens appear in plate LIX, three representing the human head and one the head of a bird. These are not figurines in the true sense, but are merely heads broken from the rims of bowls.

Mr Moore's collections from the Bear Point mounds furnish several very well-preserved specimens of bowls and vases with wide mouths and narrow collars, besides a number of heads of birds and mammals of usual types, derived, no doubt, from the rims of bowls. All repeat rather closely the finds of Mr Parsons, shown in plates LIV to LIX. Specimens from Mr Moore's collections are presented in plates LX and LXI.

Pottery of the Alabama River

Before passing eastward it will be well to notice the collections made by Mr Clarence B. Moore in the valleys of the Alabama and Tombigbee. An examination of the superb series of vases obtained from mounds at several points between Mobile and Montgomery makes it clear that the Gulf Coast tribes extended inland well up toward the middle of the state. Below Montgomery there is hardly a trace of

the South Appalachian wares and only a trace of the Tennessee influence. The differences noted in passing northward from the coast are the larger size of the vessels, the more frequent occurrence of pot forms and bottle shapes, and the coarser and more siliceous character of the paste. The decorations are almost wholly of Gulf Coast types. The use of some of the larger vessels in burial is well illustrated in plate LXII. Plate LXIII contains a large bowl with animal-derived incised designs, and below is a splendid specimen of pot or caldron, 18 inches in diameter. It is characterized, as are others of the same group, by a line of vertical ridges encircling the upright neck. In plate LXIV have been brought together a well-shaped bottle, of northern or western type, embellished with simple incised scroll work, and two tobacco pipes. One of the latter, *b*, is somewhat suggestive of Appalachian forms, and the other, *c*, is of the heavy southern type.

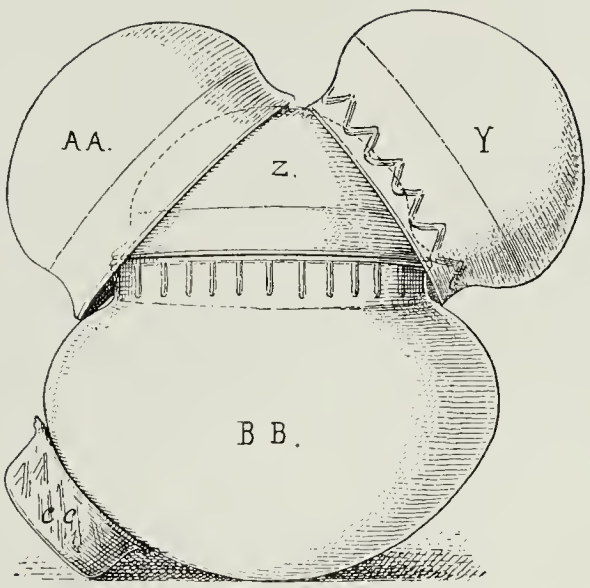
Pottery of Choctawhatchee Bay

The next point east of Pensacola bay at which Mr Moore obtained collections is Waltons Camp, situated at the western limit of Choctawhatchee bay, Florida. In the main the ware repeats Perdido bay forms, as will be seen by reference to plates LXV, LXVI, LXVII. Three typical bowls are given in plate LXV, and two platters, one with plain circular margin and the other with six scallops, are shown in plate LXVI. The form is exceptional, and all the pieces have been perforated on burial. The incised designs of the scalloped specimen probably represent the fish. In plate LXVII have been assembled outlines of a large number of the Waltons Camp specimens. They serve for comparison with collections from points east and west. We are here within the range of the stamped ware typical of the Appalachian province, and a fragment with a simple angular type of filfot figure is shown in figure 53.

Among the animal forms obtained at this point are two strongly modeled heads of large size, apparently representing geese. Shell forms are common (see plate LXVII), and the engraved designs, treated farther on, are striking and instructive. From four sites along the northern and eastern shores of Choctawhatchee bay Mr Moore obtained large and very interesting collections. Perdido bay and western forms prevail, but there is a strong infusion of elements of Appalachian and Floridian art. A fragment of a cylindric bowl with the head of a duck modeled in relief at the top and conventional incised figures representing the body below appears in plate LXVIII *a*; and two views of a hunchback-figure vase are given in *b* and *c*.

Of special interest is a small jar or bottle from a mound on Jolly

[a] Moore, Clarence B., Certain aboriginal remains of the Alabama river, in Journal of the Academy of Sciences, vol. XI, Philadelphia, 1899.



a (DIAMETER BB 17½ INCHES)



b (DIAMETER 17¼ INCHES)

BURIAL VASES WITH COVERS, ALABAMA

GULF COAST GROUP

(MOORE COLLECTION)



a (DIAMETER 14⅓ INCHES)



b (DIAMETER 17½ INCHES)

VESSELS OF LARGE SIZE WITH INCISED AND RELIEVED ORNAMENTS, ALABAMA

GULF COAST GROUP

MOORE COLLECTION)



a (DIAMETER 4⅛ INCHES)



b (ACTUAL SIZE)



c (ACTUAL SIZE)

BOTTLE WITH SCROLL DESIGN AND TOBACCO PIPES, ALABAMA

GULF COAST GROUP

(MOORE COLLECTION)



a (DIAMETER 15¼ INCHES)



b (DIAMETER 12¼ INCHES)

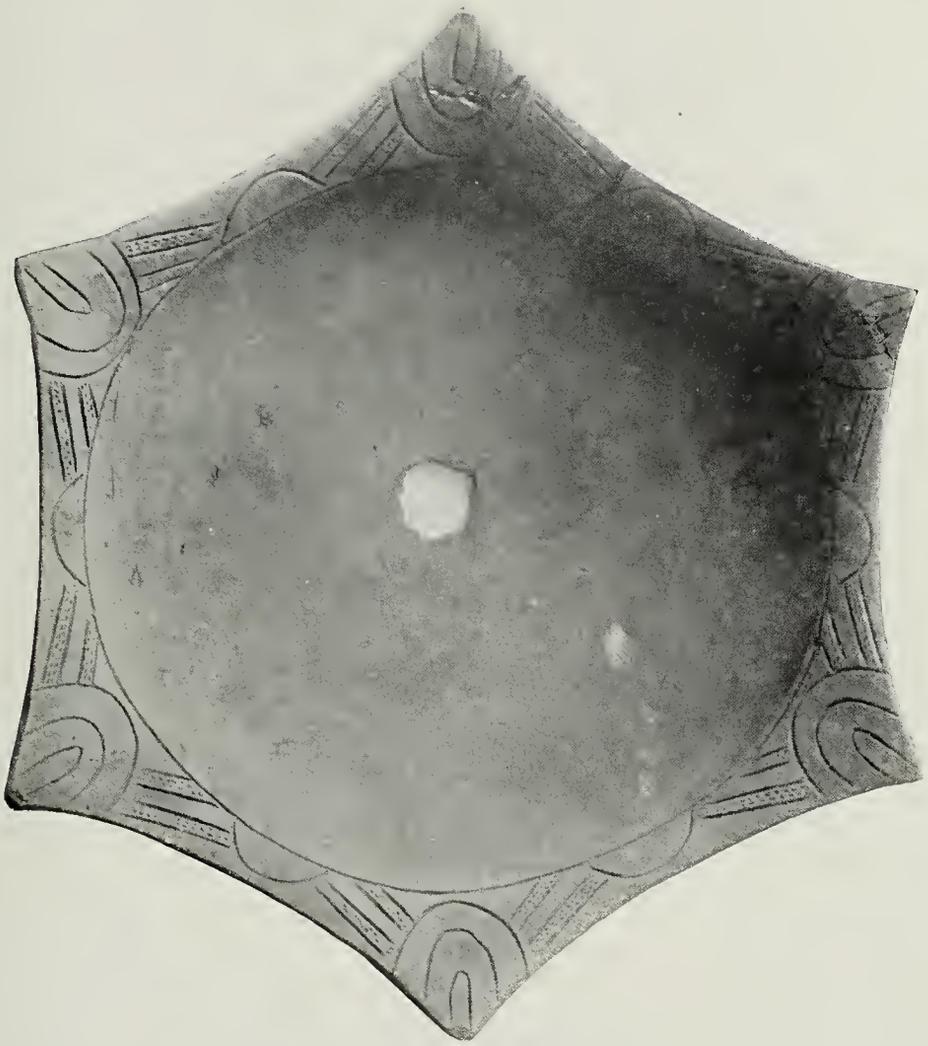


c (DIAMETER 15½ INCHES)

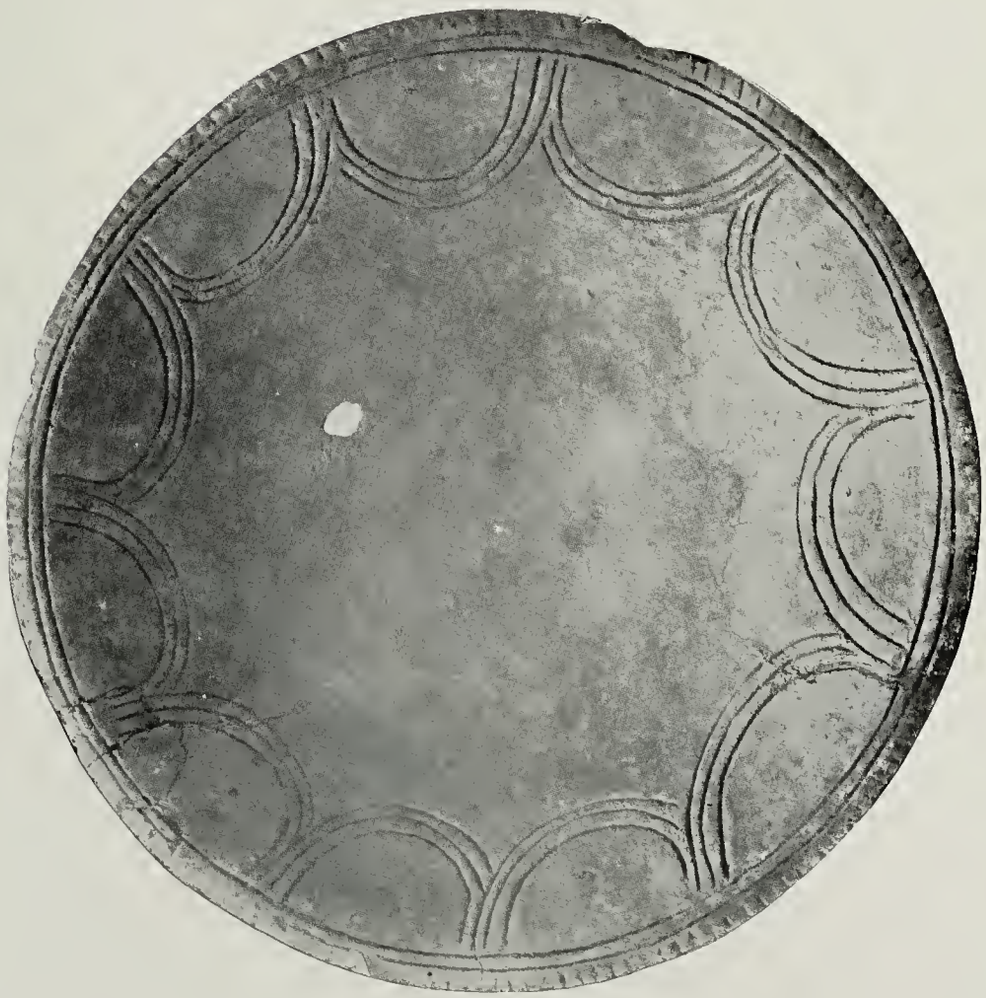
BOWLS WITH INCISED DESIGNS, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



a (DIAMETER 14¾ INCHES)



b (DIAMETER 13 INCHES)

PLATTERS WITH INCISED DESIGNS, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



VESSELS WITH INCISED DESIGNS, FLORIDA

GULF COAST GROUP

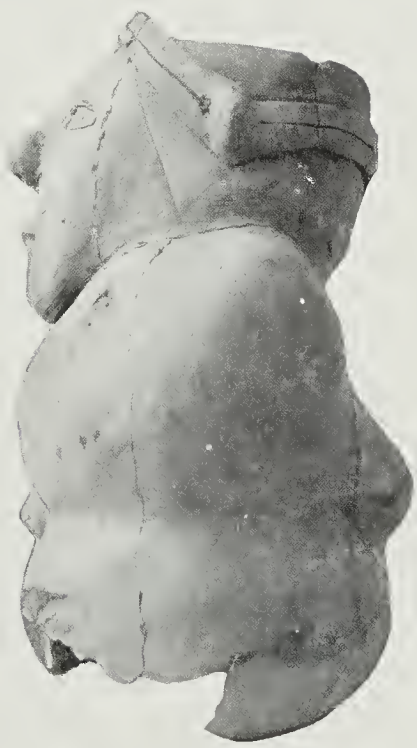
(MOORE COLLECTION)



a (HEIGHT 7¼ INCHES)



b



c

(HEIGHT 9 INCHES)

FRAGMENT OF VASE WITH A DUCK'S HEAD IN RELIEF AND VASE REPRESENTING A HUNCHBACK HUMAN FIGURE, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)

bay, on which an eagle and an eagle-man mask are inscribed. These figures are shown in plate LXIX. Plate LXX *a* illustrates a curious dish with elaborate incised and indented designs representing conventionalized life forms. A rude bowl with highly conventional bird symbols appears in *b*. Both specimens were perforated before burial. In *c* we have the top view of a bowl with incurved rim, about the lip of which are engraved devices probably intended to represent the frog.

The most striking and instructive ware yet brought from the Gulf coast was obtained by Mr Moore from Point Washington, on the eastern margin of Choctawhatchee bay, just south of Jolly bay. Here the local group of ware prevails to a large extent, but two or three other varieties take a prominent place, not, apparently, as a result of the intrusion of outside peoples or of their ware, but through the adoption by local potters of the forms and symbols of neighboring districts. The exotics are the stamped ware of the Appalachian district to the north, and two or more varieties of somewhat well differentiated Florida pottery. Plate LXXI includes a large number of the bowls, ladles, etc., in outline, and specimens of exceptional interest appear in plates LXXII–LXXIV.

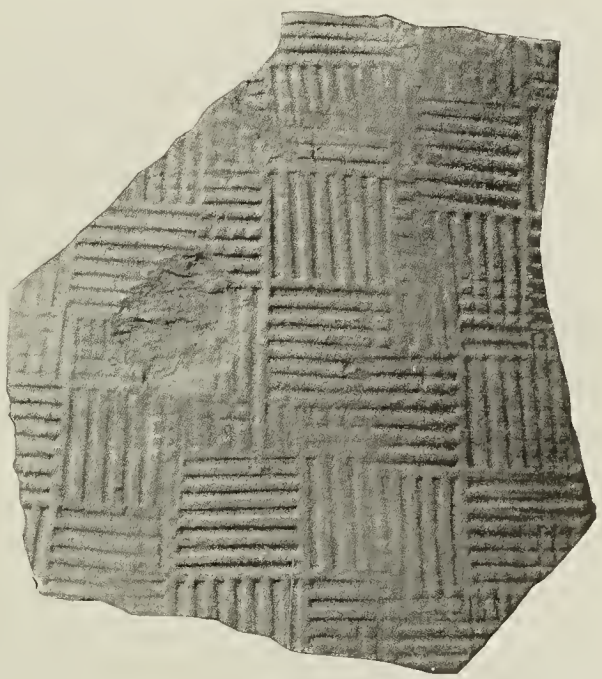


FIG. 53—Fragment of vessel with stamped design, from Waltons Camp, Choctawhatchee bay, Florida.

Plate LXXII illustrates three pieces which resemble the Mobile-Pensacola ware, but show rather exceptional forms and decorations. The deeply incised lines of the elaborate patterns have, in two of the specimens, been filled in with some white substance, giving a striking effect and reminding one of Central American methods of treatment.

These people had a marked fancy for embellishing their vases with animal forms, and birds and beasts have been much utilized. In plate LXXIII we have three fine bowls embodying the frog concept, partly in low relief and partly in very conventional incised lines. Plate LXXIV contains two delineations, probably of the owl. The interesting point

is that the conventional incised features representing the body and wings grade into the generalized ornament.

Plate LXXV represents a handsome bowl with engraved design, meant apparently for the frog, which was found by Mr Moore inverted over a skull in a grave at Point Washington, Florida.

APALACHICOLA WARE

It is interesting to note that here and there along the Gulf coast there are certain pieces of pottery that do not affiliate fully with the ordinary ware and that at the same time appear to present closer analogies with the wares of Yucatan and the Caribbean islands than do any of the other varieties; such peculiarities are more marked in the Choctawhatchee-Apalachicola section than elsewhere. The specimens brought together in plates LXXVI and LXXVII, belonging to Mr Moore's Point Washington finds, offer, to my mind, these hints of exotic influence. At the same time, they can not be divorced from their close affiliations with the ware of the Gulf coast to the west and with that of the Florida peninsula to the east.

Two vessels of rather rude shape are shown in plate LXXVI *a* and *b*. The upper part of the body is embellished with a wide zone of stamped figures, such as are common over a vast area to the north and east of Choctawhatchee bay. The most interesting feature of these designs is that, though typical of the South Appalachian stamped ware, they are seen at a glance to embody the commonest concepts of the Gulf Coast group—the conventional life elements, in which the eye, the teeth, and the body features of the creature are still traceable. Similar vessels are found toward the east, along the Florida coast, and appear in connection with a group of vases typically developed on Apalachicola drainage in Franklin county. The peculiar little vessel shown in *c* has an oblong, flattened body, rudely suggesting an alligator's head. The incised markings affiliate with the Mobile-Pensacola decoration. Vase *d* departs from western models, and approaches closely forms of ware typically developed on the peninsula of Florida. The remaining figure, *e*, is the top view of a small jar with a remarkable rounded lip. Although the engraved designs embody the Gulf Coast life elements, the method of execution departs radically from the normal treatment. The elaborate figures are traced over nearly the entire vessel, and are deeply incised, the channels being carefully carved out, leaving rounded ridges between them. The form and the material unite with the decoration in indicating a type of ware radically different from that of the Mobile-Pensacola district, yet represented by few other pieces in our collections. It affiliates most closely with the Apalachicola forms.

Equally distinct from the Mobile-Pensacola ware are the five pieces shown in plate LXXVII *a*, *b*, *c*, *d*, and *e*. In ornamentation their asso-



a



b



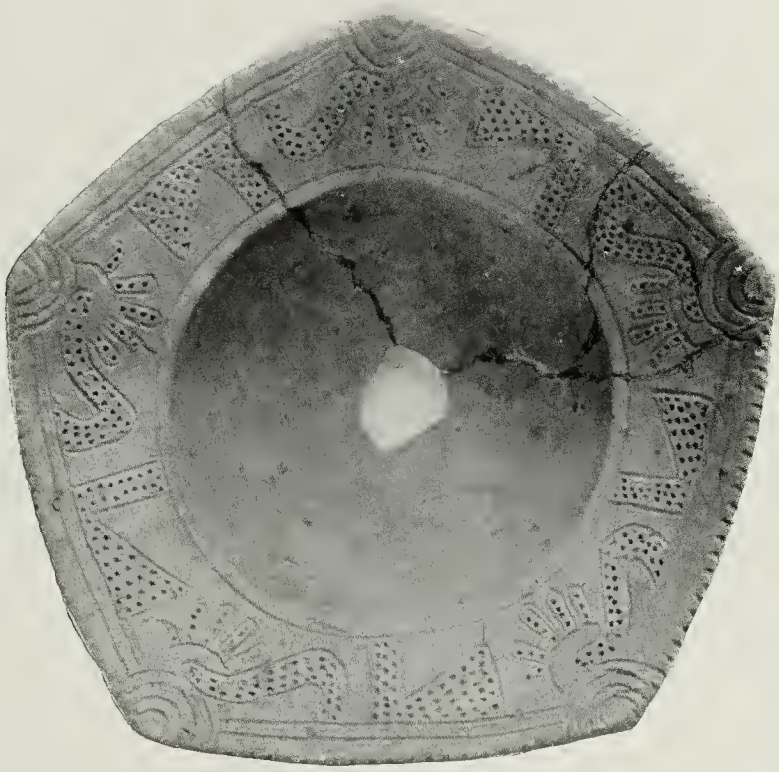
c *d*

(HEIGHT 4½ INCHES)

VASE WITH ENGRAVINGS OF AN EAGLE AND AN EAGLE-MAN MASK, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



a (DIAMETER 7¼ INCHES)



b (DIAMETER 4½ INCHES)

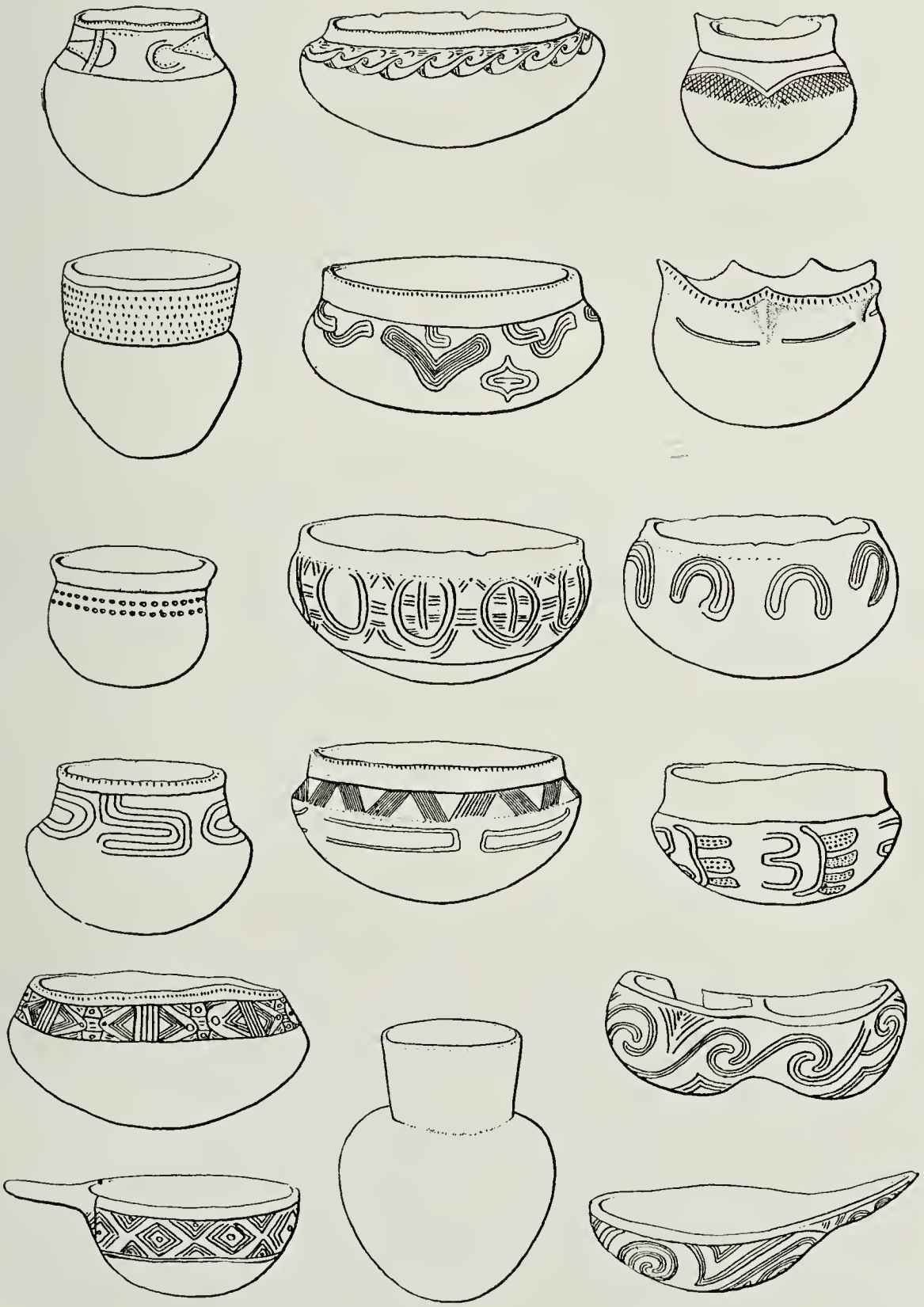


c (DIAMETER 9 INCHES)

PLATTER AND BOWLS WITH ENGRAVED DESIGNS, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



OUTLINES OF VASES WITH ENGRAVED DESIGNS, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



a (HEIGHT 4 INCHES)



b (DIAMETER 4½ INCHES)



c (HEIGHT 4¾ INCHES)



d (HEIGHT 7½ INCHES)



e (DIAMETER 5½ INCHES)



f (DIAMETER 5¼ INCHES)

BOWLS AND BOTTLES WITH ENGRAVED DESIGNS, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



a (DIAMETER 15½ INCHES)



b (DIAMETER 10 INCHES)



c (DIAMETER 14½ INCHES)

BOWLS WITH RELIEVED AND INCISED DECORATIONS REPRESENTING THE FROG CONCEPT, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



a (DIAMETER 11½ INCHES)



b (HEIGHT 5½ INCHES)



c (DIAMETER 7¾ INCHES)

BOWL WITH RELIEVED AND INCISED DECORATIONS REPRESENTING THE BIRD CONCEPT, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)



BOWL INVERTED OVER A SKULL IN BURIAL, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION, DIAMETER 15 INCHES)



a (HEICHT 6 INCHES)



d (HEIGHT 3¼ INCHES)



c (LENGTH 6 INCHES)



b (HEIGHT 6¾ INCHES)



e (DIAMETER 6 INCHES)

VASES WITH ENGRAVED AND STAMPED DESIGNS, FLORIDA

GULF COAST GROUP

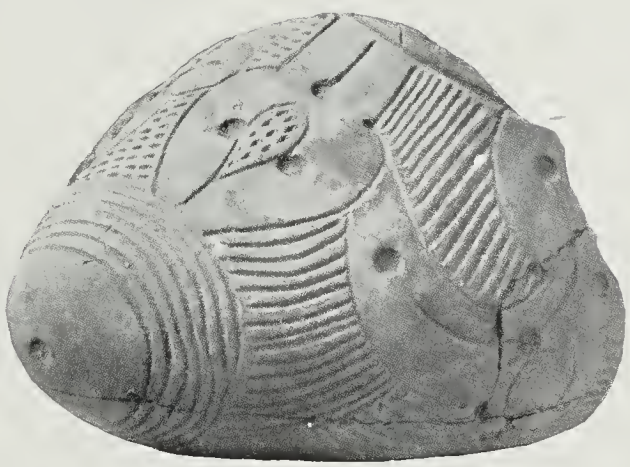
(MOORE COLLECTION)



a (HEIGHT 4½ INCHES)



b (HEIGHT 3½ INCHES)



c (HEIGHT 4 INCHES)



d (HEIGHT 6 INCHES)



e (HEIGHT 3¼ INCHES)

VASES WITH ENGRAVED DESIGNS, FLORIDA

GULF COAST GROUP

(MOORE COLLECTION)

ciation is close with the pottery found at Tarpon Springs and other central and western peninsular sites. Their paste, color, and some details of form connect them with the Apalachicola ware. The fragment shown in *c* appears to represent a well-executed vessel corresponding in shape to *c* of the preceding plate.

A characteristic and very interesting series of vessels was acquired recently by the National Museum from Mr C. H. B. Lloyd, who exhumed them from a mound in Franklin county. Ten of these are shown in plate LXXVIII. They represent a wide range of form and finish. The paste is silicious but generally fine-grained, and in some pieces flecks of mica are plentiful. The color is a warm gray, save in one case, where the firing has given a mottled terra-cotta red. In general they are South Appalachian rather than Floridian, as is indicated by their material, form, and decoration. Two pieces resemble the porous ware of Florida in appearance and finish. Three are decorated with elaborately figured stamps, and one is painted red. Incised lines appear in a few cases. Unstamped surfaces are finished with a polishing stone. All are perforated, a hole having been knocked in the bottom of each, save in one case, in which a circular opening about an inch in diameter was made while the clay was still soft. This vessel has a thickened rim, flat on the upper surface and nearly an inch wide. A rudely modeled bird's head is affixed to the upper surface of the rim. The surface is rather roughly finished and has received a wash of red ocher. A small fragment of another similar vase, supplied with an animal head, belongs to the collection, and a closely analogous specimen, now in the National Museum, came from a mound near Gainesville.

A remarkable vessel—a bottle with reddish paste, squarish cruciform body, as viewed from above, and a high, wide foot—is shown in plate LXXVIII, and on a larger scale in plate LXXVIII A1. A vertical view in outline is given in 2, and the engraved design encircling the base—partly broken away—appears in 3. The four flattish horn-shaped wings that extend from the collar out over the body, ending in rounded projecting points, constitute a wholly unique plastic feature, although the engraved figures are repeated in sherds from northern and western Florida. The lines and figures are deeply engraved and almost certainly represent some graphic original, traces of the life features appearing through the mask of convention. Something in the general appearance and decorative treatment suggests Caribbean work, and in the shape of the base and the band of encircling decoration there is a hint of Yucatec treatment; still the piece is, as a whole, essentially Floridian.

Three vessels shown in plate LXXVIII, the largest pot and two smaller pieces, have collars of stamped figures, the remainder of the surface being somewhat rudely polished. In two cases the stamped

figures are sufficiently complete to permit a practical restoration of the full design. While I was observing the unique and remarkable nature of these designs and their dissimilarity to the ornamental designs of the surrounding areas in the United States, the idea of comparing them with the decorative conceptions of the West Indies occurred to me. The result of this study has been presented in a separate paper.[a]

Researches made by Mr Clarence B. Moore in 1902 among the mounds of the west coast of Florida, between St Andrews bay on the west and Cedar keys on the east, have brought to light a remarkable series of vases, a few specimens of which I am able to add at the last moment in plates LXXIX, LXXIX A, and LXXIX B. Several exceptional features appear, among which are certain compound and eccentric forms, bird shapes displaying most interesting treatment of wings and other features; and pierced walls, the openings representing the interspaces of the designs. The well-marked local characters grade off into western, northern, and eastern forms, so that no decided break occurs at any point. Stamp-decorated ware displaying a great variety of the highly elaborate figures occurs everywhere in association with the prevailing variety.[b]

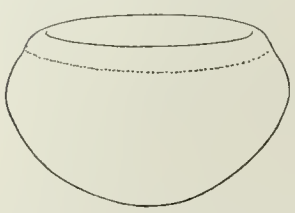


Fig. 54.—Bowl with thick collar, Tampa bay. Diameter 8½ inches.

Miscellaneous Specimens

Associated with the above-described ware along the Gulf shore are bowl-shaped vessels characterized by a peculiar thickening of the lip

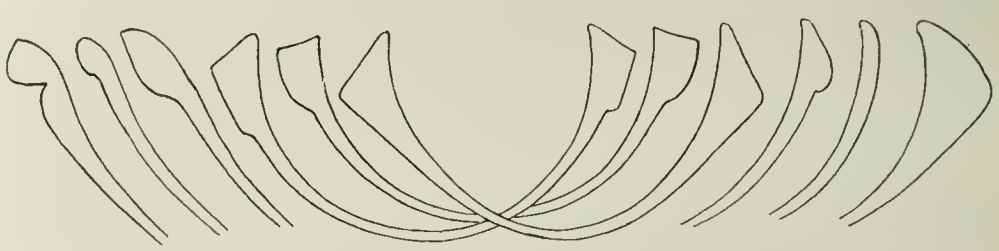
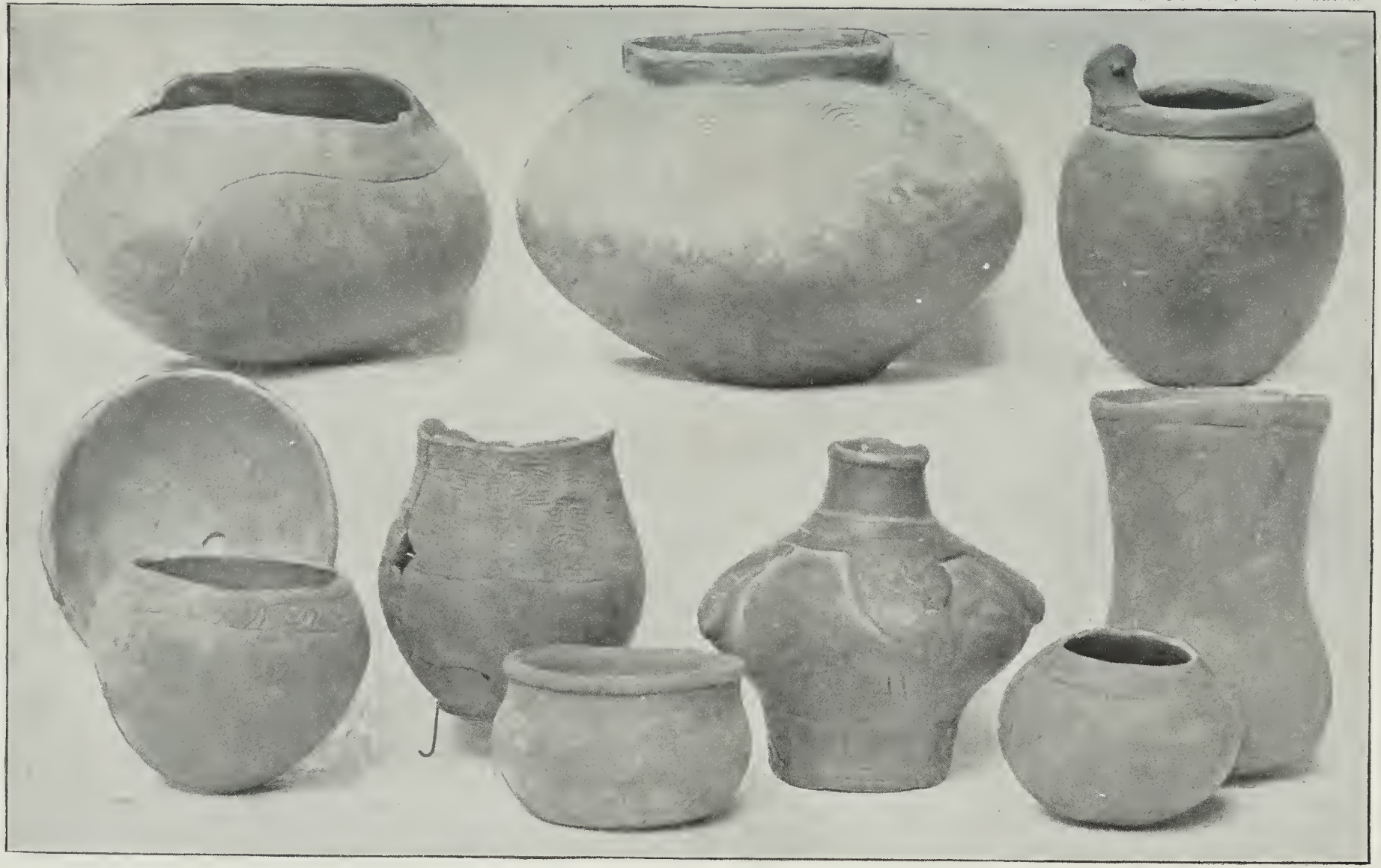


Fig. 55—Sections of thick-rimmed bowls, Early county, Georgia.

or rim, and by the presence, in many cases, of red coloration. The largest collection of these vessels in our possession comes from a village site in Early county, Georgia, although specimens are found about Mobile bay and all along the west coast of Florida to Tampa and even father south. They are best illustrated by the collections of Mr A. S. Gaines and Mr K. M. Cunningham, now in the National Museum. These vessels, mainly in fragments, are not separable from the other

[a] Holmes, W. H., Caribbean influence on the prehistoric ceramic art of the southern states, in the American Anthropologist, vol. VII, number 1, January, 1894.

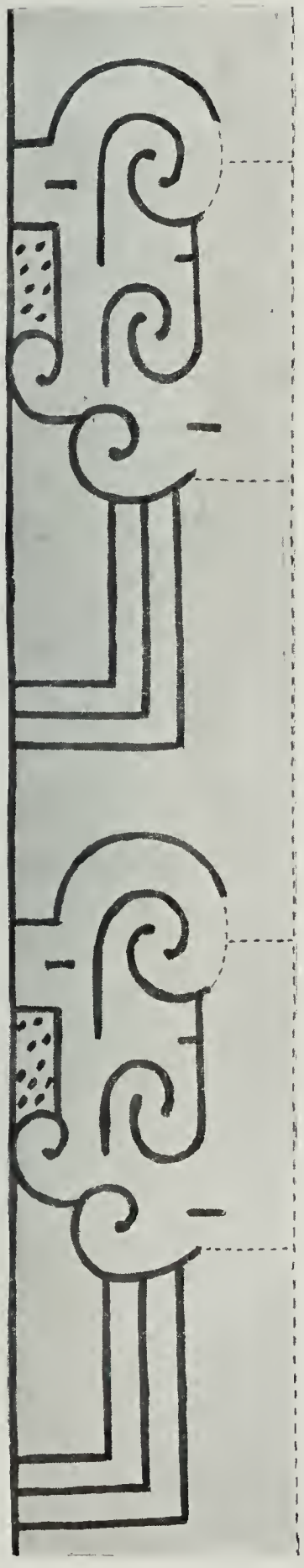
[b] Moore, Clarence B., Certain aboriginal remains of the northwest Florida coast, part II, Philadelphia, 1902.



GROUP OF VASES FROM A FLORIDA MOUND

GULF COAST GROUP

(DIAMETER OF LARGEST VASE 10¾ INCHES)



3



1 (HEIGHT 6½ INCHES)



2

UNIQUE BOTTLE WITH ENGRAVED DESIGNS

GULF COAST GROUP



a (ONE-FIFTH)



b (ONE-FOURTH)



c (ONE-FIFTH)



d (ONE-THIRD)



e (ONE-FOURTH)



f (ONE-FOURTH)

BIRD-FORM VASES WITH INCISED DECORATIONS SUGGESTING THE ORIGIN OF MANY CONVENTIONAL ORNAMENTS

NORTHWEST FLORIDA COAST

(MOORE COLLECTION)



1 (DIAMETER 8 INCHES)



2 (ONE-THIRD)



3 (ONE-FOURTH)



4 (ONE-THIRD)

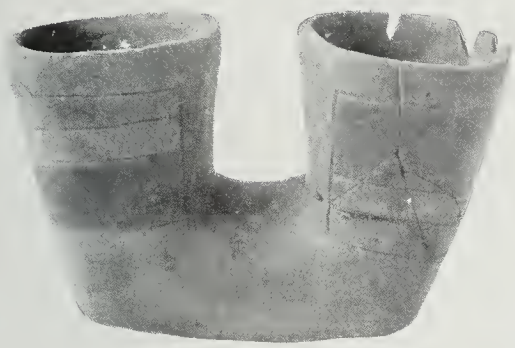


5 (ONE-THIRD)

VASES WITH INCISED AND RELIEVED DECORATION

NORTHWEST FLORIDA COAST

(MOORE COLLECTION)



1 (ONE-THIRD)



3 (ONE-FIFTH)



5 (ONE-FOURTH)



6 (ONE-THIRD)



2 (ONE-FOURTH)



4 (ONE-THIRD)

VASES OF EXCEPTIONAL FORMS

NORTHWEST FLORIDA COAST

(MOORE COLLECTION)

forms of pottery associated with them, although they exhibit features so peculiar as to suggest that the type may have had a separate origin. They are associated, at different points, with the remains of nearly every variety of southern pottery. Although from the richest of shell-bearing districts, this ware, in common with the Appalachian pottery, is usually tempered with silicious matter.

The thickening of the margins of vessels in this group is a notable and peculiar feature belonging to the ware from no other region. A specimen from Tampa bay, Florida, is presented in figure 54, and a series of sections is given in figure 55. The surface retains but little of the red color. These bowls are symmetric in shape and were neatly finished with the polishing tool. Usually a thin coat of red ocher has been applied. In a few cases the color forms simple patterns, as is shown in figure 56. The pattern in this example is executed in white paint on a red ground. This vessel has a flaring rim, only slightly thickened.

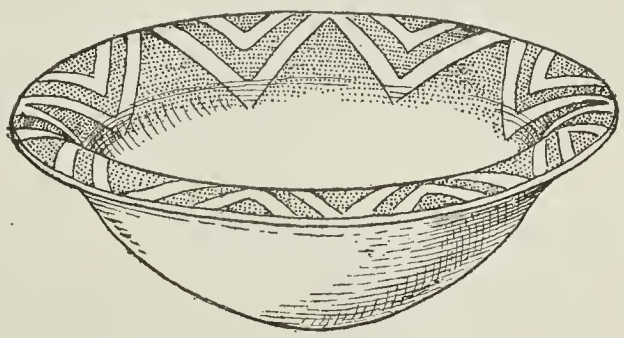


Fig. 56—Bowl from Mobile district, with patterns in color.

In specimens from Mobile shell heaps there is, as has been already mentioned, a certain suggestion of Mexican or Central American art, and it is not impossible that definite correlations with the ware of the South may in time be made.

Life Elements in Decoration

Before more eastern groups are treated, attention may be given to the interesting decorations of the Central Gulf Coast ware. The formal designs—the groupings of straight and curved lines, the meanders, the guilloches, and the scrolls—were at first treated independently of the life forms so variously embodied in the vessels; but as these studies advanced it came to be realized that the life idea runs through all the designs, and that the formal figures are connected by an unbroken series of less and less conventional forms with the semirealistic incised designs and with the realistic plastic representations as well. This is a very important matter to the student of the embellishing arts. The investigation was begun by assembling each variety of creature embodied in the ware—man, quadrupeds, birds, reptiles, batrachians, and fishes—placing the most realistic representations in both relieved and incised forms first, the others following in the series according to progress in conventional modification. The purpose was to ascertain whether there was general consistency, whether

each variety of creature passed down to the purely conventional forms through its own peculiar and distinctive series of variants. The conclusion reached is that there is at least a large degree of consistency, and that particular forms of creatures may be recognized far down the scale toward the geometric. Exceptions were noted, however. The symbols are occasionally intermingled, as if the significance of the particular forms had been lost sight of, the potter using them as symbols of the life idea in general, or as mere decorations.

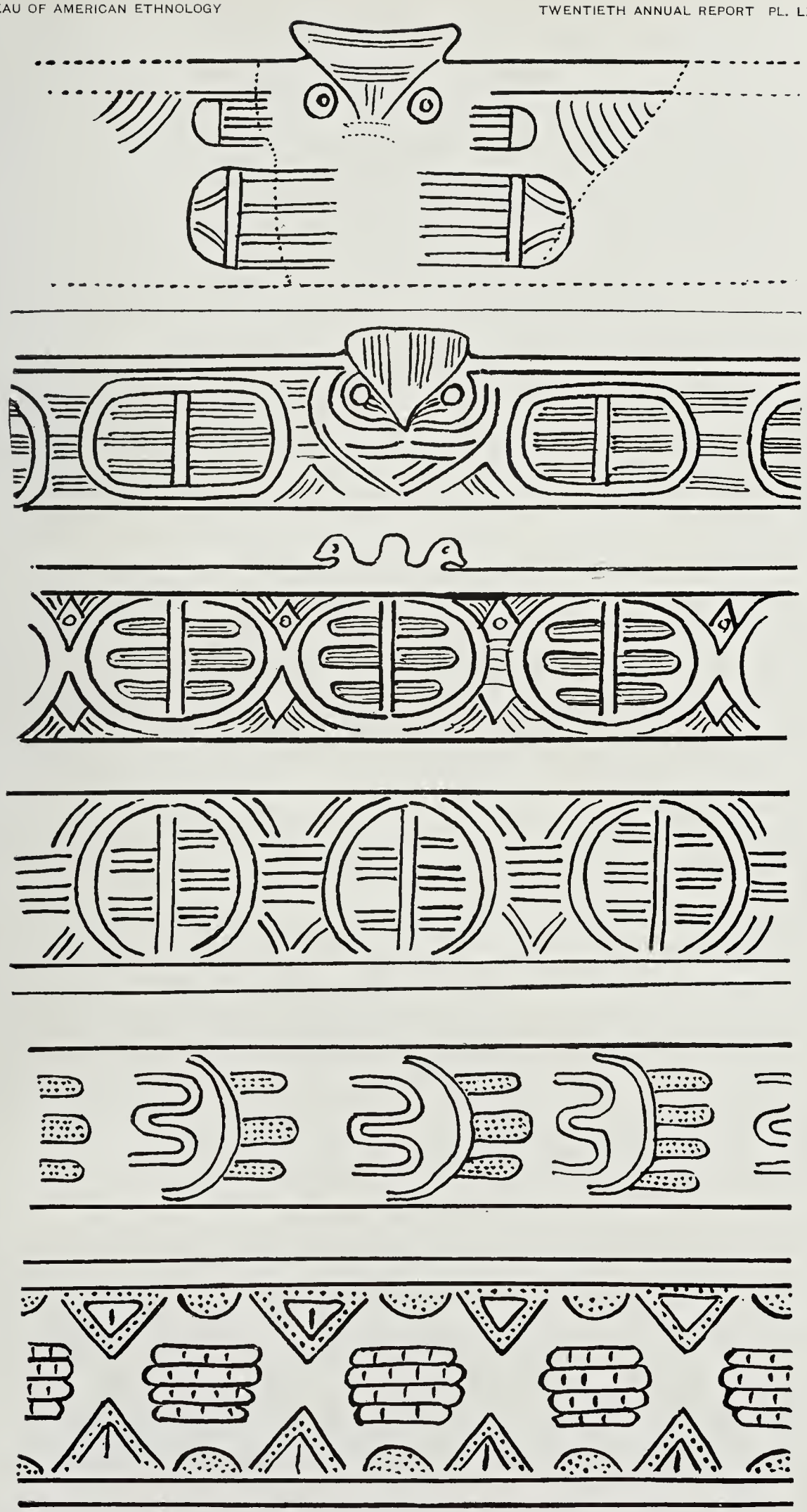
As a rule, the incised designs are more highly conventional than the plastic, the eagle and the serpent being the only incised forms, so far as has been observed, realistically treated; but it was possible to recognize others through their association with the modeled forms. In vessels furnished with the head of a bird in relief, for example, the same kind of incised figures were generally found around the vessel, and these are recognized as being more or less fully conventionalized representations of wings. The same is true of the fish and its gills, fins, and tail; of the serpent and its spots and rattles, and of the frog and its legs. The relieved figures, realistically treated, become thus a key to the formal incised designs, enabling us to identify them when separately used. It will be seen, however, that since all forms shade off into the purely geometric, there comes a stage when all must be practically alike; and in independent positions, since we have no key, we fail to distinguish them, and can only say that whatever they represented to the potter they can not be to us more than mere suggestions of the life idea. To the native potter the life concept was probably an essential association with every vessel.

In plate LXXX is arranged a series of figures illustrating progressive variations in the bird concept, and in plate LXXXI the frog concept is similarly represented. The series are too limited to be entirely satisfactory, as it is only when a great number of these designs are before us that we see clearly the meaning of the transformations. Plates LXXXII and LXXXIII show some purely conventional designs, and many more or less fully conventionalized life forms copied from vessels of this group.

POTTERY OF THE FLORIDA PENINSULA[a]

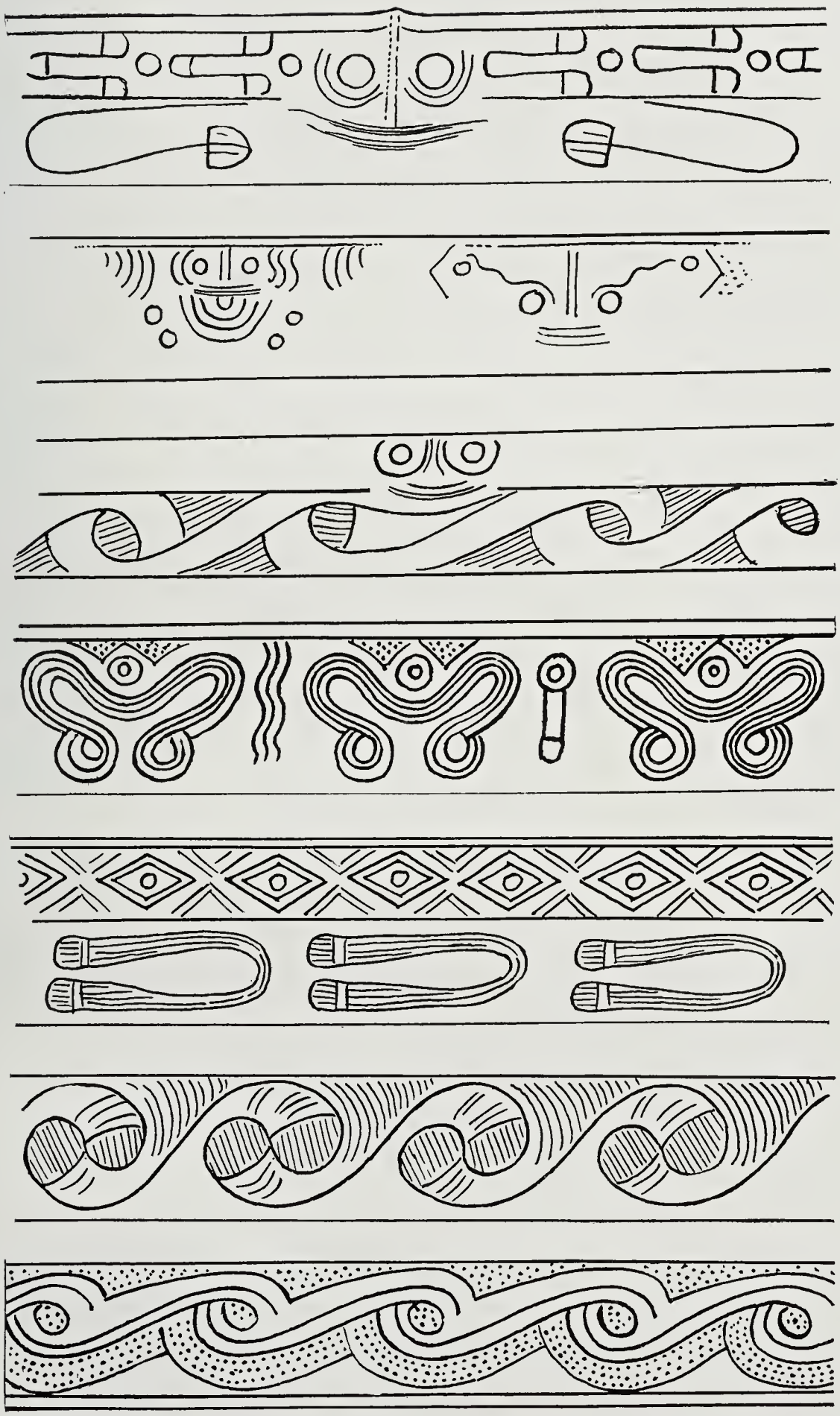
Exploration on the peninsula of Florida has made such decided headway in recent years that archæologists may now reasonably hope to secure a firm grasp on the problems of Floridian prehistoric art. The general nature and range of the art remains are already fairly well understood, but little study has been given those details that must

[a] Acknowledgments are due to Mr Clarence B. Moore for a large part of the data embodied in this brief study of Florida pottery. Not only have his published works been drawn on but correspondence and frequent consultations with him have furnished valuable assistance. As an indefatigable worker, an accurate observer, a faithful recorder, and a prompt publisher, Mr Moore stands at the head of the long list of those who have undertaken personally to explore the ancient monuments of the eastern United States.



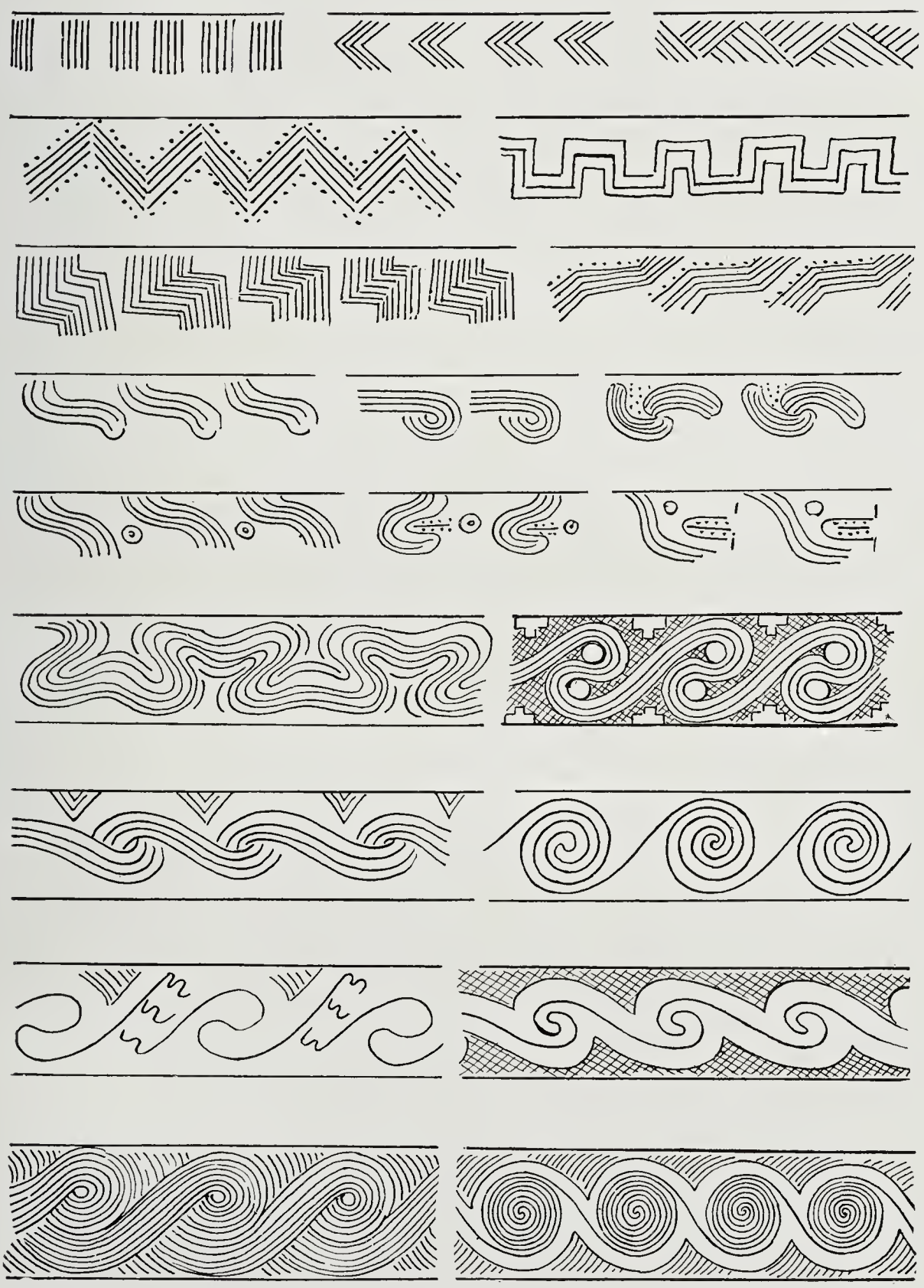
ENGRAVED DESIGNS REPRESENTING THE BIRD CONCEPT, FLORIDA

GULF COAST GROUP



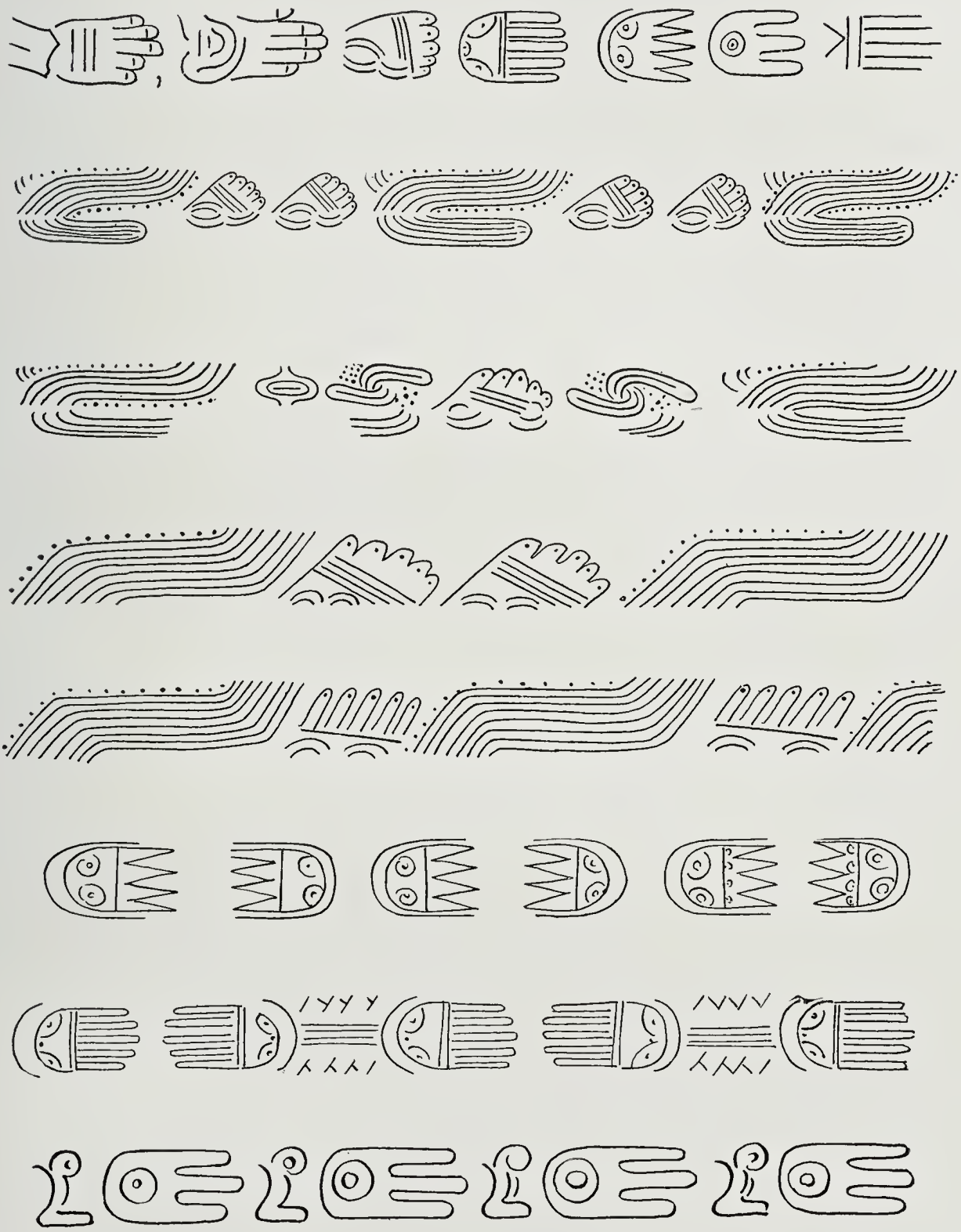
ENGRAVED DESIGNS REPRESENTING THE FROG CONCEPT, FLORIDA

GULF COAST GROUP



ENGRAVED DESIGNS, ALABAMA AND FLORIDA

GULF COAST GROUP



ENGRAVED DESIGNS, ALABAMA AND FLORIDA

GULF COAST GROUP

be relied upon to assist, first, in assigning these relics to particular tribes and stocks of people, second, in correlating them with culture features of neighboring regions, and, third, in determining questions of chronology. The extensive and careful researches of Mr Clarence B. Moore seem destined to fairly initiate this important work, and Mr F. H. Cushing has conducted very important excavations along the western coast, the results of which, although only half published, give us the first clear and definite insight into the life and habits of the prehistoric inhabitants of the Gulf coast.

Historic Aborigines

The group of tribes occupying Florida during the period of Spanish discovery and conquest belongs to what is now known as the Timuquanan linguistic family. These people have now entirely disappeared, and little is definitely known of their arts or history. Other tribes have since occupied the territory, but none have been permitted to remain except a few Seminoles, some two hundred strong, who now occupy portions of the Everglades. There appears to be only the most meager record of the making of pottery by any of the historic tribes of the peninsula, yet pottery making was the rule with the southern Indians, and we may fairly assume that all of the tribes found in the peninsula by the Spanish were potters, and that much of the earthenware obtained from the mounds and shell heaps belonged to tribes of the historic linguistic stocks of the general region. The Timuquanan peoples are probably fully represented, but Muskogean influence must have been felt, and at least one of the principal varieties of pottery found in the northern half of the peninsula was typically developed in the region occupied by that stock. Traces of intrusive ideas are present, perhaps even traces of peoples from the West, and evidences of Antillean (Arawak) contact on the east have recently come to light. As the case stands, however, we have such slight historic knowledge of the native ceramic art of Florida that no part of its products can, with entire safety, be attributed to any particular tribe or stock of people.

The colored plate presented as the frontispiece of this paper is reproduced from a drawing by John White, of the Roanoke Colony, 1585–1588. It represents a native woman holding in her hand what appears to be an earthen bowl. This is one of the few authentic illustrations extant of a native of "Florida" in Colonial times.

The ware of Florida is extremely varied and presents numerous pronounced types of form and decoration, but it is found very difficult to separate it into groups other than regional. The various forms are intimately associated, the diversified characters grading one into another in the most confusing manner. It is very much as though the peninsula had been occupied by peoples of distinct origins, who had come together on common ground in such intimate relations that

their respective cultures became in a large measure blended. This apparent intermingling of elements would seem to pertain to a late rather than to an early period.

Chronology

Questions of antiquity naturally present themselves for consideration in this place, but very definite answers can not be given. We may reasonably anticipate that in time the ceramic evidence will materially assist in determining the succession of peoples and also in arriving at a somewhat definite chronology of events. The ware embedded in successive layers of midden refuse gives hints of change and progress, and the absence of sherds in the subordinate strata points apparently to a time when pottery was not used by the tribes represented. Then again the higher forms of ware appear well up in the strata and prevail over the surface of the country in general. Mr Moore refers to the topic in the following language:

> When after a long and careful search in a shell heap no pottery is brought to light, it may be considered that the makers of the heap lived at a time when its method of manufacture was unknown. Pottery filled so great a want in the lives of the aborigines and was so extensively used by the makers of the shell heaps, where it is found at all, that it seems impossible to account for its absence upon any hypothesis other than the one suggested. One fact relating to pottery which Professor Wyman neglects to state is that in many shell heaps pottery is found to a certain depth only, after which it disappears. In other shell heaps, pottery plain and ornamented is found in association for a time, after which unornamented pottery alone is found. These points in connection with the pottery of the shell heaps have been noticed in so many scores of cases that the writer is convinced that many shell heaps were in process of formation contemporaneously with the first knowledge of the art of pottery making and its subsequent development. * * * It is well known that later Indians occupied the shell heaps as places of residence long after their completion, some doubtless cultivating them, and hence distance from the surface is a most important factor in determining the origin of shell-heap relics of all sorts.[a]

Range of the Ware

The pottery in our collections from Florida comprises a wide range of technic and esthetic characters. There are specimens rivaling the best work of the Lower Mississippi region, and others so rudimentary as hardly to deserve the name of earthenware. There are also numerous varieties resulting apparently not so much from differences in peoples and time as from the diverse uses to which they were applied. One group is wholly unique, consisting in the main of toy-like forms of rude workmanship, and exhibiting decidedly abnormal characters. There is good reason for supposing that it was manufactured exclusively for mortuary offerings, as it is associated almost wholly with burials. Again, the shell heaps furnish an inferior variety of ware quite peculiar to them. It is difficult to say just how much of this inferiority is due to antiquity and how much to the fact that midden

[a] Moore, Clarence B., Certain shell heaps of the St Johns river, American Naturalist, November, 1892, p. 916.

ware in general is rude on account of its manufacture for the preparation of food and its exclusive use in that process. The pottery of the burial mounds, except the peculiar ware mentioned above, and of the country in general is of a higher grade, often exhibiting neat finish, varied and refined forms, and tasteful decorations. Considered as a whole, the ceramic art of the Florida peninsula indicates a state of culture much inferior to that of the middle and lower Mississippi valley.

Materials

The clay used, considering the whole peninsula, seems to have had a wide range of composition and to have been subjected to varied methods of treatment. The inferior pottery shows poorly selected materials and rude treatment, while the better product is characterized by finely prepared paste. Much of the ware is of unusually low specific gravity, as if rendered porous by weathering or decay of some of the denser ingredients.

The tempering materials are also varied. Much of the shell-deposit ware has been tempered with fibrous vegetal matter, such as pounded grass or bark, thought by Wyman to be palmetto fiber, which burned out in firing or has disappeared through decay, leaving the paste light and porous. This ware is rude and coarse in texture and is said to occur only in the older shell deposits. In many places the paste is exceptionally free from tempering ingredients, being fine-grained and chalky. These conditions may be due to the nature of the available materials rather than to any peculiar local ethnic conditions. The soft paste prevails in the St Johns river region and extends also to the west coast. The gritty paste of the Appalachian provinces reaches southward into northern Florida and is found, though quite rarely, down the east and west coasts. The use of pulverized shell is noted in a few cases along the west coast.

Manufacture

The vessels were built up often of wide strips of clay, which, in many cases, were so poorly worked or welded together that the vessels fall to pieces along the joints. In the ruder pieces the lines of junction are still traceable, especially on the inner surfaces, where neat finish was difficult or unnecessary. The walls of the ruder ware are thick, clumsy, and uneven; those of the better varieties are thin, uniform, and evenly dressed. The finish is also varied, ranging from the roughest hand-modeled surfaces through those variously textured to well-polished surfaces. In many cases a thin coat of finer clay has been applied to the exterior to hide the coarse materials and render the polishing easy.

The baking or firing seems to have been of several grades or varieties; usually, however, the surfaces show the mottlings characteristic of

the open-air treatment common with the tribes of the United States. The paste in the more porous wares is often somewhat whitened superficially by volatilization of vegetal elements, the interior of the mass remaining dark or black. In some localities decided reddish and yellowish tints are seen, a result probably of oxidization of iron contained in the clay. The improvised mortuary wares are generally only slightly baked.

Forms

The forms of the ordinary ware, as well as those of the "freak" mortuary pottery, are much diversified. Vessels of the culinary class are apparently not numerous; but, being especially subject to breakage, they rarely appear in collections except as sherds. Neither the pot nor the deep caldron are common. Cups and bowls, the latter often of large size, are very numerous, a subglobular form with constricted lip being typically Floridian. Bottles, or forms approaching the bottle in shape, are rare, while eccentric and compound forms occur in all sections. Bottoms are rounded, conic, or slightly flattened. Handles are not an important feature, while feet or added bases of any kind are rarely seen in the normal ware. Animal forms were modeled with considerable freedom in later times, and occasionally shells of mollusks and the gourd were imitated. The shapes as a whole are inferior to those in the districts to the north and west, although, if we include the improvised mortuary pottery, they are far more diversified.

Decoration

Decoration is varied and heterogeneous, so much so that it can not properly be described, except in connection with illustrations. It rarely includes fabric- and cord-marked surfaces, but the paddle stamp, with varied designs, was used extensively in most sections. Incising and indenting were employed in working out designs of many classes, and especially symbolic subjects. In some varieties of ware the work was very crude, in others it was extremely skillful. The application of red ocher was general, and simple designs were executed in this pigment. Decorative effects were also secured by roughening the surface in various ways, as by pinching up the soft clay with the finger nails, and by modeling ridges, nodes, and other forms in low or high relief. The lip or rim is often embellished by notching or scalloping. The subject-matter of the designs ranges from the simple geometric elements to somewhat realistic, although crude, delineations of men and animals. Conventional treatment of life forms is often exceptionally refined and effective, but symbols of special or highly developed types have not been identified.

Uses

The uses to which the pottery of Florida was devoted were about the same as among other native tribes. There were vessels to serve

in the full range of domestic activities—cooking, carrying, containing, eating, and drinking—and others for ceremonial offices, and for burial with the dead. There were also miniature vessels, as well as figurines representing animals, probably intended to be used as toys. There were tobacco pipes, beads, and pendants, and other objects not assignable to any particular use.

The employment of earthenware in burial is of special interest. The dead were buried in ordinary graves and in sand and earth mounds, and, exceptionally, in shell mounds, and here as elsewhere it was customary to deposit various utensils with the bodies; but there are some curious and interesting features connected with the practice. Over much of the territory covered by this paper the vessels were deposited in the graves entire and are so recovered by our explorers, but in the Florida peninsula, and to some extent in Georgia and Alabama, a practice had arisen of breaking the vessel or perforating the bottom before consigning it to the ground. The most satisfactory explanation of this proceeding is that since the vessel was usually regarded as being alive and endowed with the spirit of some creature of mythologic significance, it was appropriate that it should be "killed" before burial, that the spirit might be free to accompany that of the dead.

The facts brought out by recent explorations of Mr Moore add new features of interest.[a] In cases it is apparent that the vessels were not only broken for burial, but that fragmentary vessels were used; and again that, as in the case of the Tick Island and other mounds, sherds were buried, serving probably as substitutes for the entire vessels. An exceptional feature of these phenomena is the presence in some of the burial mounds of sherds broken out to rudely resemble notched spear and arrow points. It would seem that the sherd was made to represent the vessel which was formerly buried entire, and that, possibly, extending its office to another field, it was modified in shape that it might take the place of such implements of stone and other materials as were formerly devoted to the service of the dead.

Still more remarkable is the practice, which seems to have become pretty general in Florida, of manufacturing vessels especially for burial purposes. Some of these pieces are in such close imitation of the real vessels that the distinction between them can not be drawn with certainty, while others are made with open bases, so that they did not need to be broken or "killed" when inhumed, having never been made alive. Others are of such rude workmanship and eccentric form that no ordinary use could be made of them. In seeking to explain these exceptional products two suggestions may be made: First, it is noted that the perforating of the vessels used in burial and the placing of sherds and toy-like vessels and figurines with

[a] Moore, Clarence B., Certain sand mounds of the St Johns river, Florida, Journal Academy of Natural Sciences, ser. 2, vol. x, Philadelphia, 1894.

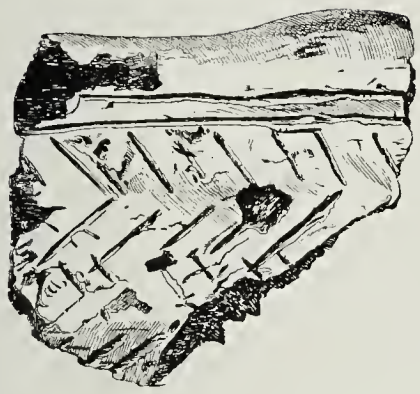
the dead is confined, mainly at least, to Florida and the Gulf coast, and further that these practices pertain to comparatively recent times. It is also observed that articles of European make—Venetian beads, Spanish olive jars, articles of metal, etc.—are found in many mounds of this region, indicating the very general practice of mound-building during a considerable period following the arrival of the Spanish—a period extending over a hundred years or more. It is suggested, therefore, that possibly this whole group of extraordinary mortuary practices may have sprung up in post-Columbian times. The most prolific sources of gain known to the Spanish were the cemeteries of the aborigines, and the seekers of El Dorado and the Fountain of Life were the princes of grave robbers. It would be but natural that people possessing the ready resources of the southern Indians, finding the graves of their fathers ruthlessly desecrated by the invaders in their mad search for gold and pearls, should, while still preserving the spirit of their mortuary customs, cease to consign to the ground any articles of real value. It will be conceded that the inroads of hordes of avaricious and mercilless strangers must have exercised a powerful influence on the habits and customs of the native tribes, and such phenomena as these mentioned might result naturally. The fact, however, that graves containing these objects are very numerous and often contain other articles of real value, as has been pointed out by Mr Moore, seems to render this theory untenable. Second, a somewhat more satisfactory explanation may be found in the idea of substitution for purely economic reasons; perhaps the demands of mortuary sacrifice grew burdensome to the people, or possibly the practice of the art in its normal phases fell into disfavor or gradually gave way to some other form of vessel-making art, while the practice of making ceramic offerings kept on in conformity with the persistent demands of superstitious custom. At any rate, the practice of hastily making sacrificial offerings of clay came into great favor and a study of the objects, many of which are illustrated in accompanying plates, shows that they embody in their rude way all varieties of form and decoration known in Florida, and shows, beside this, that the imagination ran riot imitating objects of many classes and conjuring up forms entirely new to the art.

The use of earthen vessels as receptacles for human remains has not been noted by Mr Moore in his extensive explorations on the Florida peninsula, although the practice was common in Georgia and other sections to the north and west.

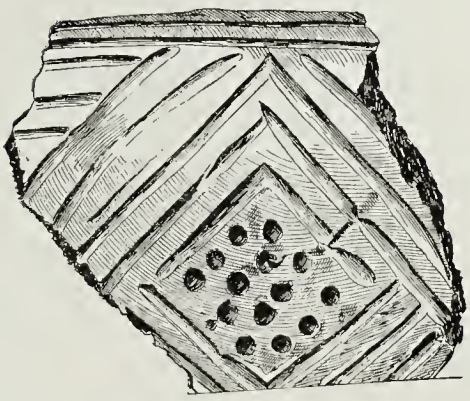
Examples

Midden ware of the St Johns

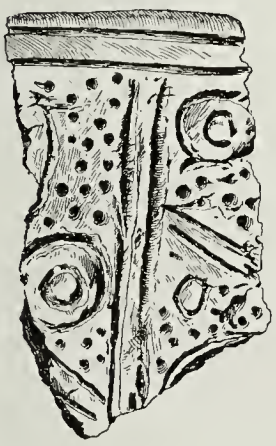
The shell mounds of the St Johns furnish varieties of ware said to be confined almost exclusively to these deposits, and supposed especially to characterize the middle period of their accumulation, the



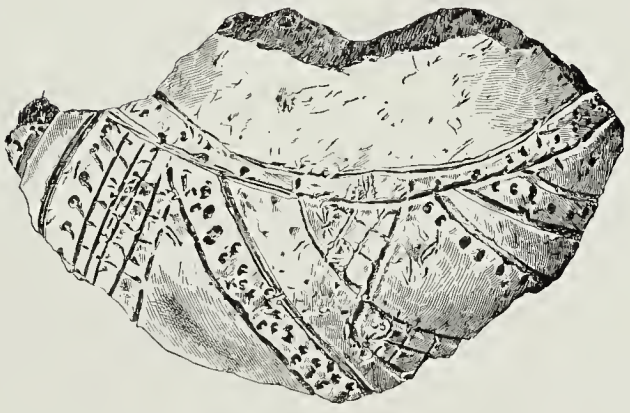
a



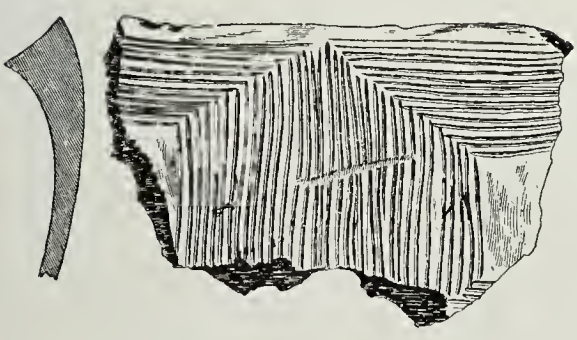
b



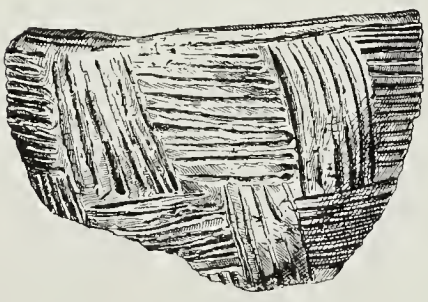
c



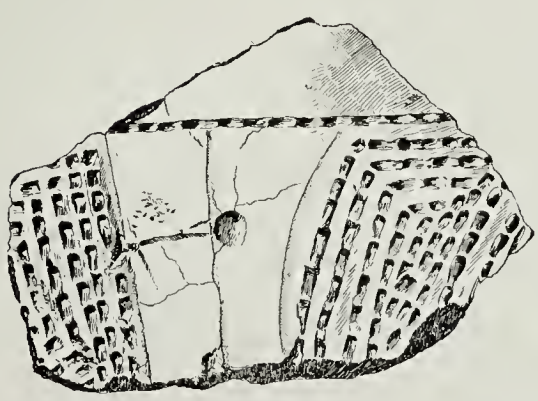
d



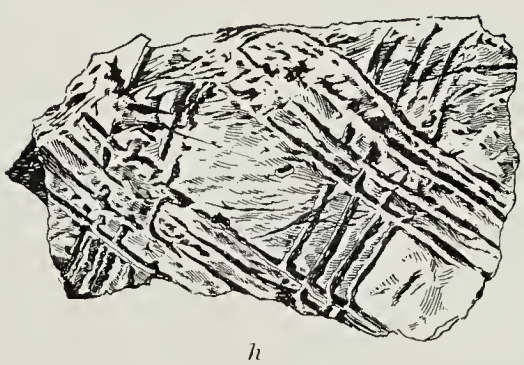
e



f



g



h

FRAGMENTS OF POTTERY FROM SHELL HEAPS

FLORIDA PENINSULA

(MOORE COLLECTION, ABOUT THREE-FOURTHS)

earlier period being without pottery, and the later having several varieties of ware, which appear on the surface in great plenty. This pottery has been recovered only in the shape of sherds, and can not be studied to the best advantage. Among the fragments are found evidences of considerable variation in texture, treatment, and ornamentation. One variety exhibits a rather fine-grained paste preserving the warm gray colors of the baked clay. The surfaces were finished with a rubbing tool, and are plain or have been rather carelessly embellished with patterns in straight and curved incised lines. Another, and the most noteworthy variety, is characterized by the unusual appearance of the paste, which has been tempered with a large percentage of fibrous matter, probably shredded palmetto fiber. This tempering substance has been destroyed by fire or decay, leaving the paste highly vesicular and porous and of low specific gravity. Generally these sherds show clearly the

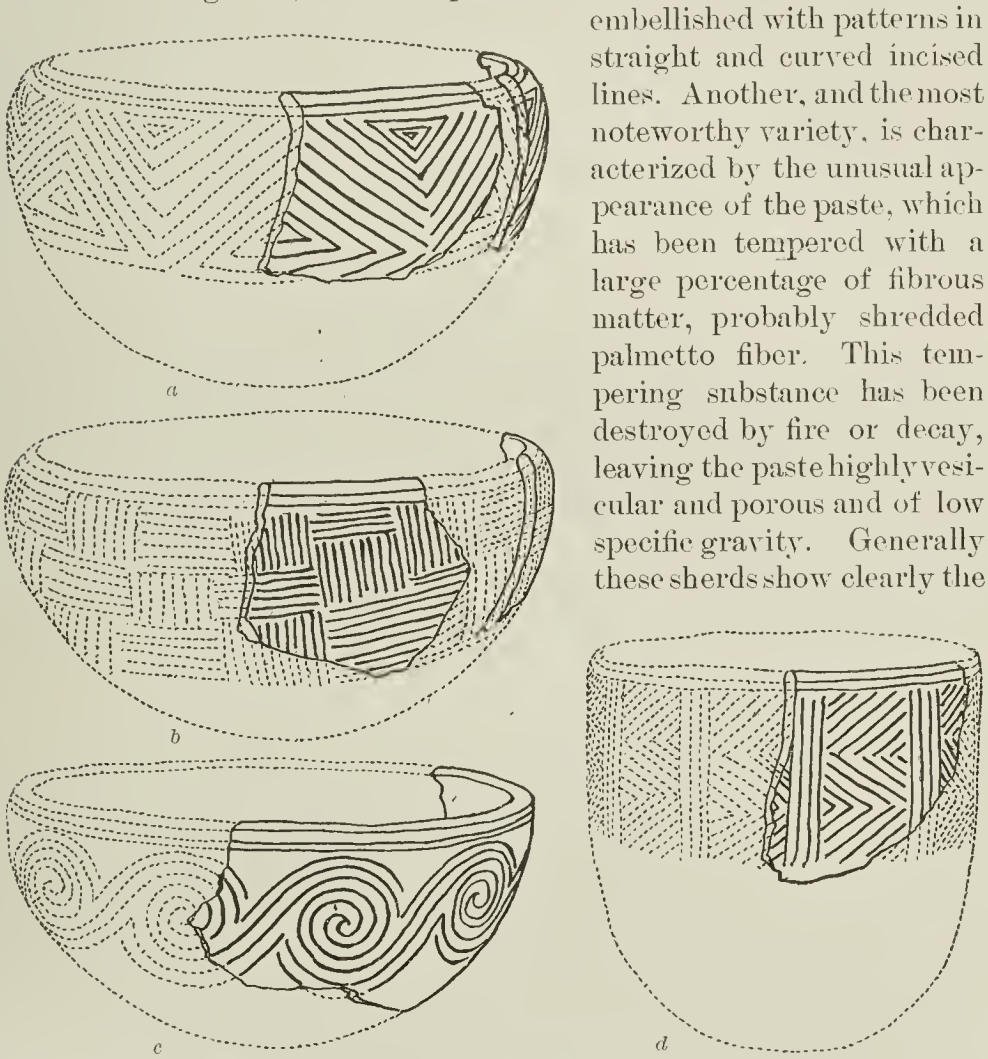


Fig. 57—Restoration of forms of fiber-tempered midden ware, St Johns river.

effects of use over fire. The walls are thick and uneven and the surfaces are rudely rubbed down. The forms appear to have consisted mainly of bowls with rims variously recurved, incurved, and otherwise modified, and with rounded or flattish bases. The diameter varies from a few inches to a foot or more. Examples restored from fragments sufficiently large to indicate the shape and suggest the true character of the ornament are shown in figure 57. They are from the Tick Island mound, and appear typical of what is assumed to be the earliest pottery-

making period. The execution of the designs is decidedly rude, the incised lines being deep, wide, and irregular. The designs themselves, however, seem to comprise not only the archaic forms seen in *a* and *b*, but running scrolls such as occur in the most advanced grades of southern pottery, as in *c*. The angular interspaces in the latter designs are filled in with indentations, as in the Mobile-Pensacola and other wares (see figure 58). There is no absolute measure of the value of particular decorative motives in determining degree of culture progress, but elaborate scroll work can hardly be called archaic, and we must conclude either that this ware does not represent the earliest use of pottery among the shell-mound peoples, or that the more western tribes, already practicing this art, encroached on the original shell-heap people at a comparatively early date. It may be remarked further that the shapes, so far as observed, are nearly identical with the prevailing shapes of the best wares of Florida. This fiber-tempered pottery was found by Wyman at Old Town, Old Enterprise, Watsons



Fig. 58—Fragments of midden-ware bowls with incised scroll decoration, St Johns river.

Landing, Silver Spring, and Palatka,[a] but no details of occurrence are given. Mr Moore obtained specimens from Tick island, Orange mound, Huntingtons, Mulberry mound, and other localities, and his determinations of relative position and age have already been quoted.

Two sherds derived from hemispheric bowls decorated with running scrolls are illustrated in figure 58. There are pieces, however, that approach the better wares of later time in texture and finish, and it may yet be shown that the earlier pottery of Florida developed without marked interruption into the later and more highly elaborated forms. Additional sherds are shown in plate LXXXIV.

STAMPED WARE OF THE ST JOHNS

The use of the stamp or figured paddle in decoration was common throughout the peninsula, extending west into Alabama and north to North Carolina and Tennessee. It is not likely that it was characteristic of any particular people or culture group. That it is not of

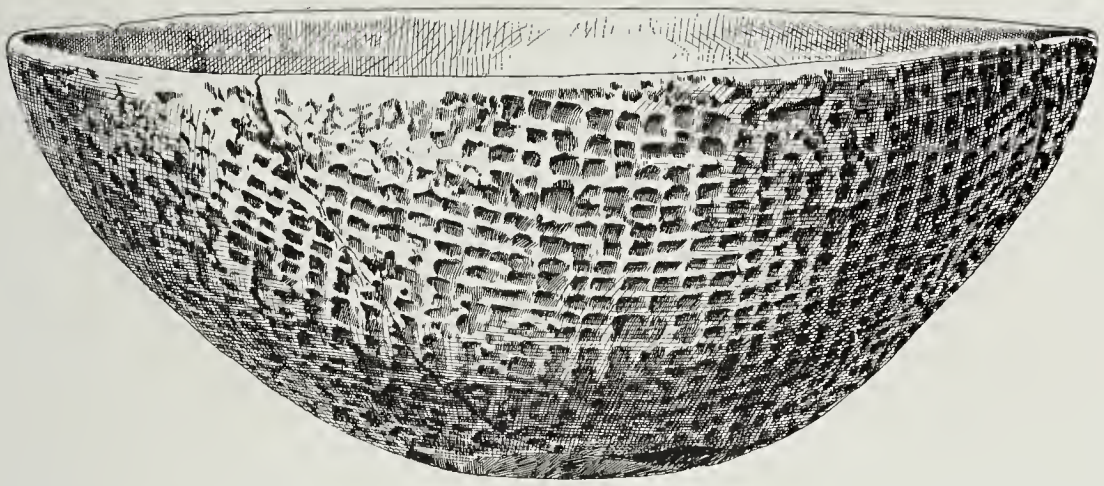
[a] Wyman, Dr Jeffries, Fresh-water shell mounds of the St Johns river, Florida, Memoirs of the Peabody Academy of Science, Salem, Mass., 1875.



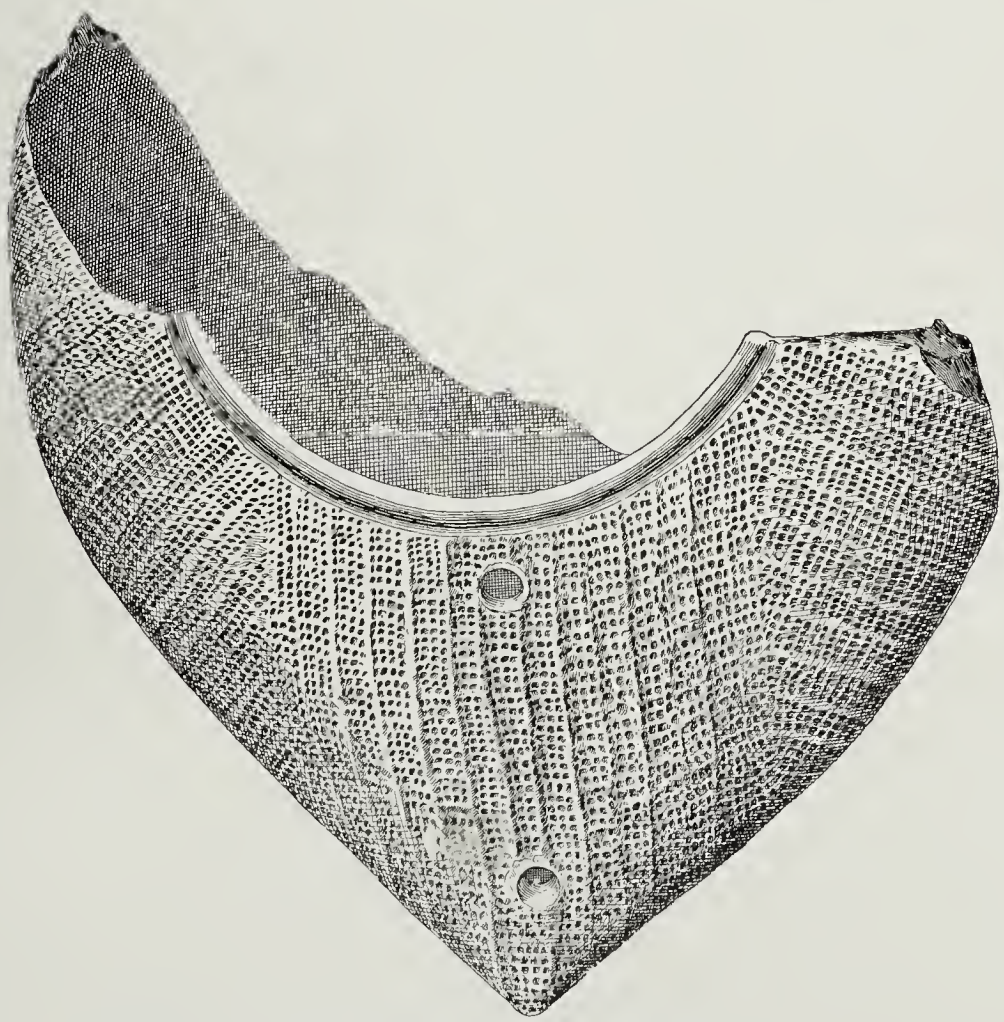
POTTERY WITH STAMP DECORATION

FLORIDA PENINSULA

(ABOUT THREE-FOURTHS)



a (DIAMETER 6½ INCHES)



b (WIDTH ABOUT 9 INCHES)

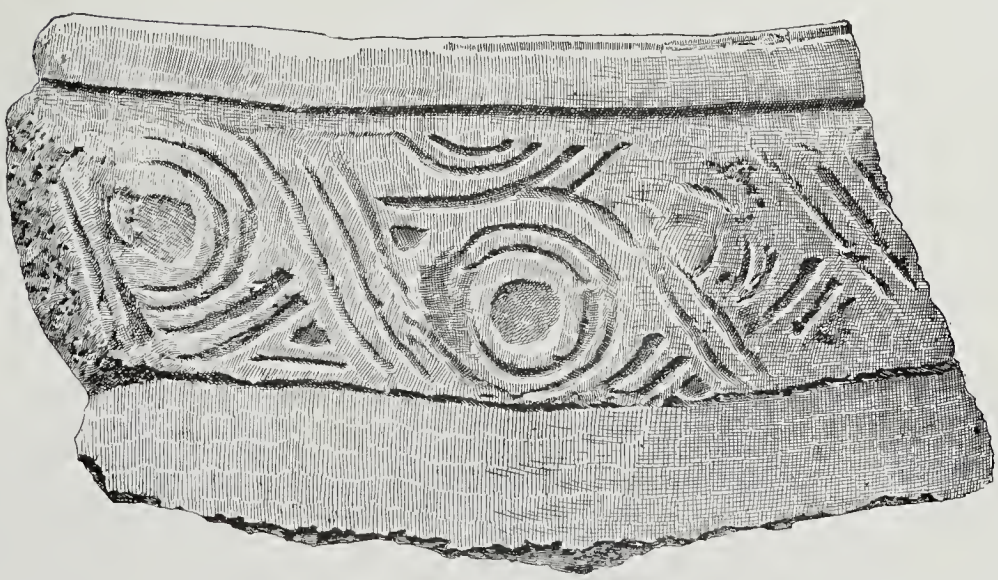
POTTERY WITH STAMP DECORATION

FLORIDA PENINSULA

(MOORE COLLECTION)



a



b

POTTERY WITH STAMP DECORATION

FLORIDA PENINSULA

(MOORE COLLECTION, ABOUT THREE-FOURTHS)



a



b

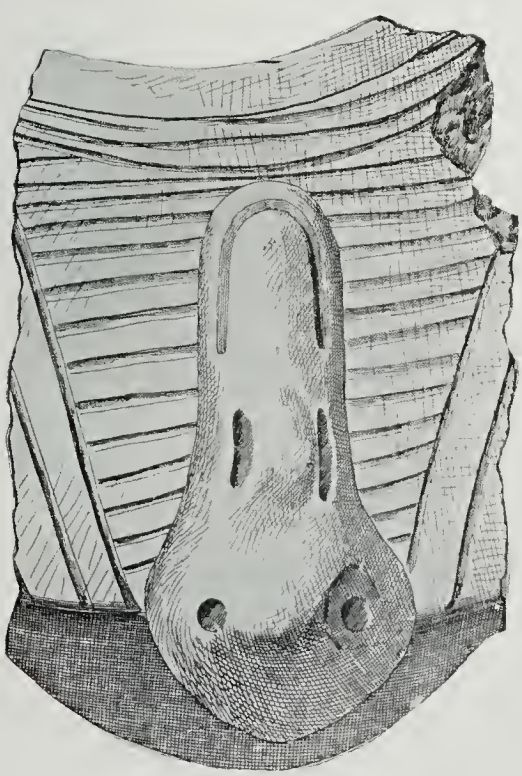
POTTERY WITH STAMP DECORATION

FLORIDA PENINSULA

(MOORE COLLECTION, ABOUT THREE-FOURTHS)



a (DIAMETER 10½ INCHES)



b (HEIGHT 4½ INCHES)



c (DIAMETER 7½ INCHES)

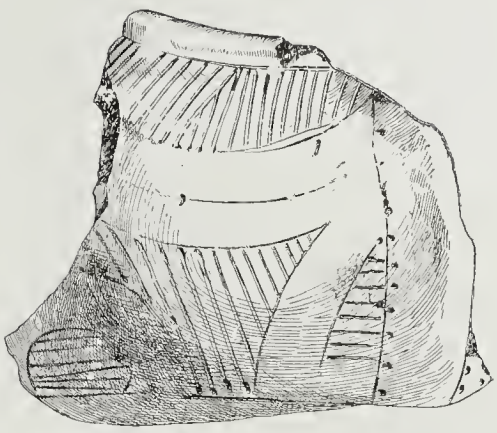
VASES WITH RELIEVED AND ENGRAVED DESIGNS

FLORIDA PENINSULA

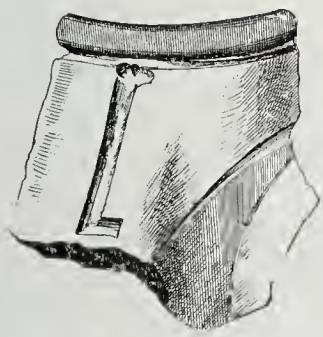
(MOORE COLLECTION)



b (ABOUT THREE-FOURTHS)



c (ABOUT ONE-HALF)



d (ABOUT THREE-FOURTHS)

a (ABOUT THREE-FOURTHS)

FRAGMENTS OF VASES WITH ENGRAVED DESIGNS

FLORIDA PENINSULA

(MOORE COLLECTION)

Mexican origin would seem to be proved by the fact that it does not occur west of Mobile bay. It is no doubt related to if not derived from the art of embellishing the vessels by impressing textile fabrics upon their plastic surfaces, practiced so extensively in the North. Mr Cushing expresses the idea, originating with his San Marco work,[a] that the use of wooden tools in which the grain of the wood gave rise to decorative surface markings might have led to the making of figured stamps or modeling paddles, but this idea requires confirmation. I have observed that some of the more elaborate stamped patterns employed are closely akin to designs used by ancient wood carvers and sculptors of the Antilles, thus suggesting some kind of connection between Florida and the islands.[b]

The ware of the St Johns shows the very common use of a modeling paddle the face of which was carved in checker patterns, consisting of shallow grooves crossing generally at right angles and numbering from five to twelve to the inch. Examples are shown in plate LXXXV. Occasionally we encounter more elaborate and artistic designs, such as prevail in the Appalachian province on the north. Various examples from the St Johns are brought together in plates LXXXVI, LXXXVII, and LXXXVIII. It would appear that the stamp paddle was not in use during the earlier stages of pottery making in Florida. According to Mr Moore the stamped ware occurs less frequently as we descend into the midden deposits, rarely appearing at any considerable depth.

ENGRAVED WARE OF THE ST JOHNS

The St Johns furnishes occasional specimens of ware of excellent make, seemingly not akin to the common pottery of the region, although apparently intimately associated with it in burial. An example is presented in plate LXXXIX *a*. It is a well-modeled globular bowl from a mound in Duval county, is 10 inches in diameter, and is tastefully ornamented with representations of a bird, probably the duck. The head of the bird is modeled in relief on opposite sides of the vessel. The bill points upward, and the wings, depicted in simple incised lines, extend around the upper part of the body of the vessel. A sketch of one of the heads appears in *b*. The duck is a prominent feature in the embellishment of Florida wares, but in many cases the forms are so highly conventionalized that only those who have traced the duck motive down from more realistic delineations can do more than guess at the original. An example of conventional duck design is presented in plate XC *a*. An equally conventional treatment, possibly of the vulture, appears in *b*. Other examples of this class are referred to in describing the pottery of western Florida. Much of the mortuary and midden ware is decorated with incised work, always carelessly executed.

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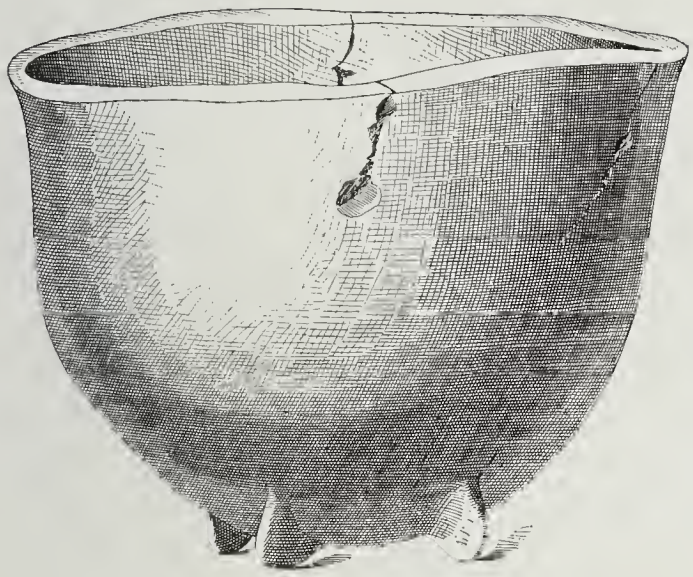
[a] Cushing, F. H., Exploration of ancient key-dweller remains, Proceedings American Philosophical Society, vol. XXXV, p. 74.

[b] Holmes, W. H., Caribbean influence on the prehistoric ceramic art of the southern states, American Anthropologist, January, 1894, p. 71.

IMPROVISED MORTUARY WARE OF THE ST JOHNS

Explorations on the St Johns have brought to light a form of earthenware having characters not heretofore observed in any locality, and likely to give rise to considerable discussion. The possible functions of this ware have already received attention. It has been found by Mr Moore and others at varying depths in the burial mounds, but never in the shell heaps. A few pieces were obtained from Mount Royal at a depth of 12 feet beneath the surface. It consists of vessels, vessel-like articles, animal figurines, miniature imitations of fruit, and various objects of eccentric shape, nearly all of rude construction and finish. As a rule these objects have the appearance of toys made by hands unskilled in the manipulation of clay and practically untrammeled by the traditions of the normal native art. The clay used was generally crude and untempered, the construction careless and hasty, and the baking very slight. Specimens worthy of being called vessels are mostly so crudely made that they would be of little service in any of the usual offices of a vessel. As a rule the bottoms of such specimens were perforated while the clay was yet soft, the opening being left rough as cut or punched, or dressed down rudely after the manner of the normal opening at the opposite end. They repeat, in a measure, the forms of the real pottery, but with many trivial variations. Decoration is in all styles, the incised, stamped, relieved, and painted, but in the main it is crude. The animal and vegetal forms are often so graphically suggested, however, that the idea of the modeler is intelligible. The panther, the wolf or dog, the squirrel, the turkey, the turtle, and the fish are more or less forcibly suggested. The size is usually small, and the clumsy forms, modeled with the unaided fingers, are solid or nearly so, the more massive portions having been in cases roughly perforated with a stick to prevent cracking and falling to pieces in the process of baking. Vegetal forms are extremely rare in the normal native art of the eastern United States, the gourd appearing in some cases as a model for earthen vessels; but in this mortuary ware various essays have been made to represent acorns, flowers, buds, ears of corn, and the like. A large number of unclassified forms, quite as rude as the preceding, resemble cylinders, cones, beads, spools, hourglasses, druggist's mortars, etc. On examination of the various ceramic collections in the United States, there are found occasional examples of small, rudely made, toy-like figures from other localities that may possibly fall into the same general class as these Florida mortuary fantasies.

The most satisfactory evidence of the close relationship of this pottery with the normal wares of Florida is its occurrence in a number of mounds at considerable depths and under varying conditions, and associated intimately with a wide range of relics. Besides this, there



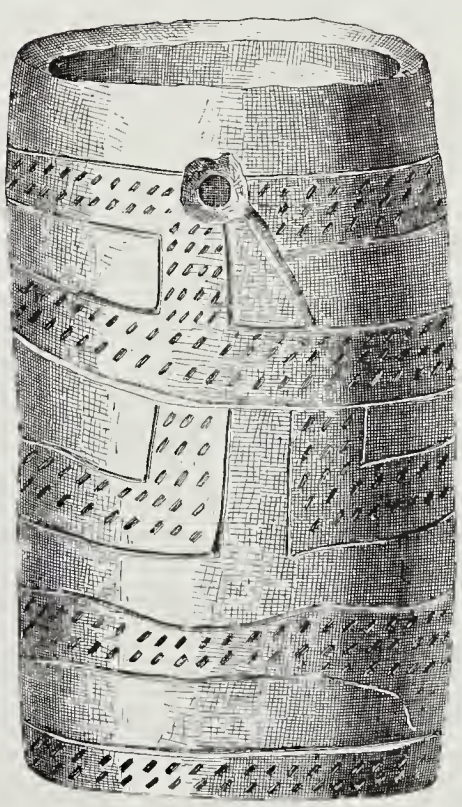
a (HEIGHT 3 INCHES)



b (HEIGHT 4 INCHES)



c (HEIGHT 4½ INCHES)

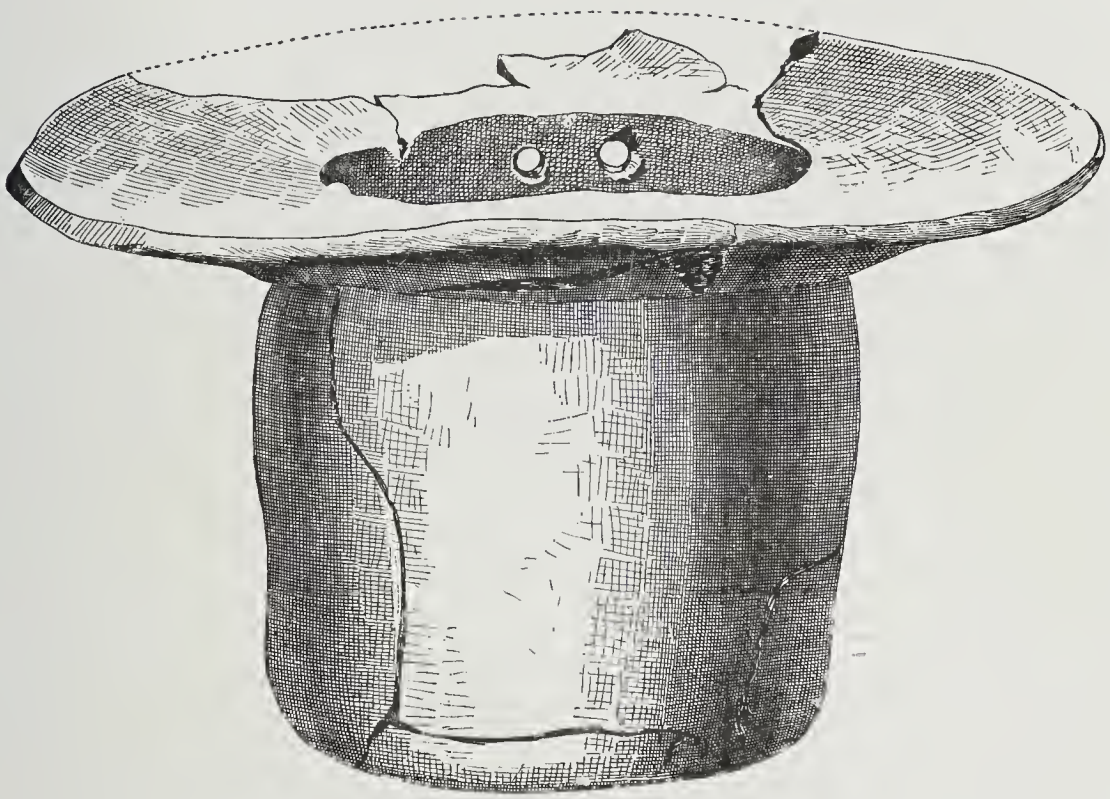


d (HEIGHT 4½ INCHES)

RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

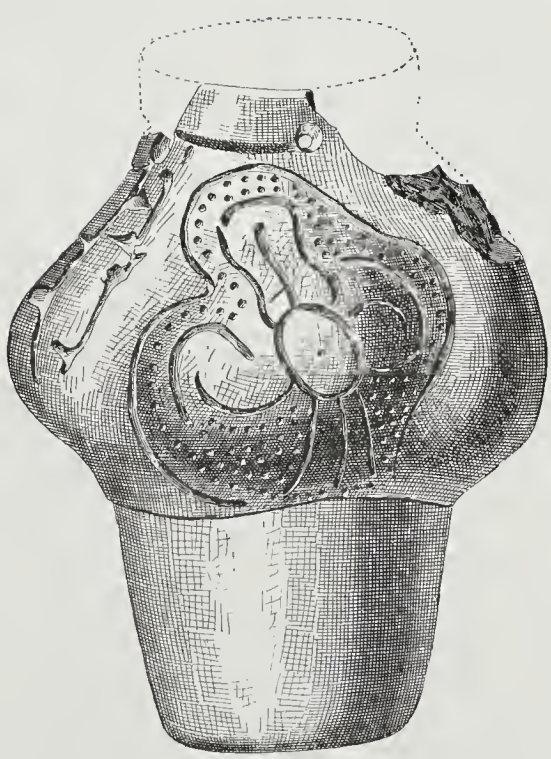
(MOORE COLLECTION)



a (HEIGHT 4 INCHES)



b (HEIGHT 4¼ INCHES)

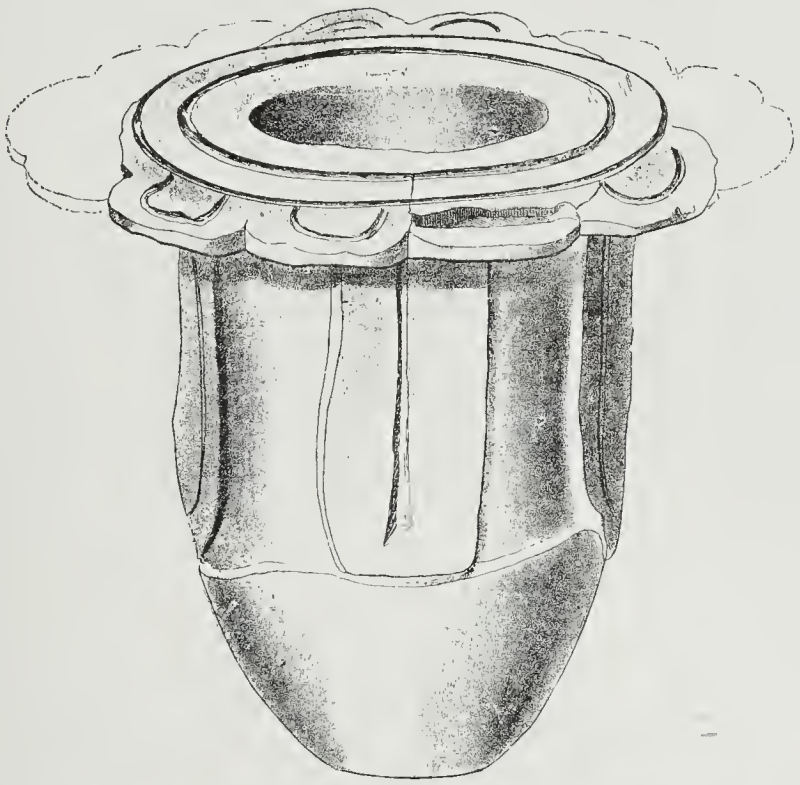


c (HEIGHT 4 INCHES)

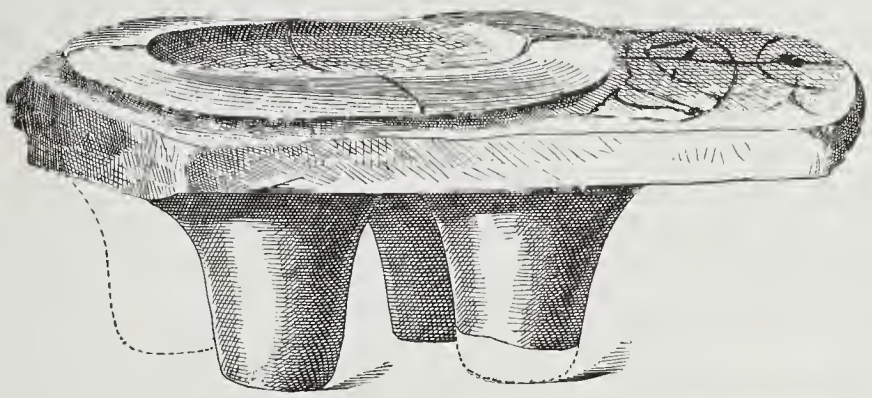
RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

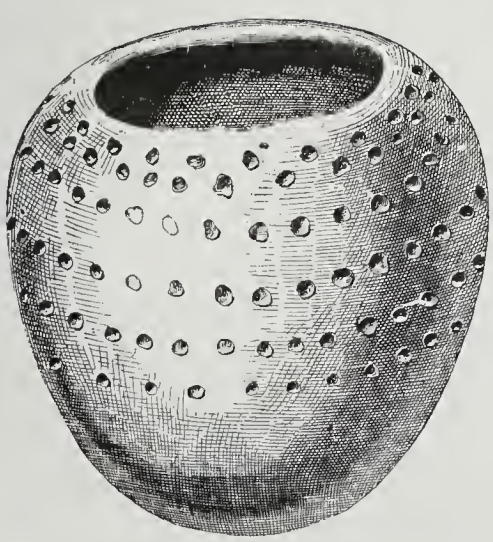
(MOORE COLLECTION)



a (HEIGHT 4 INCHES)



b (LENGTH 5 INCHES)



c (HEIGHT 3 INCHES)

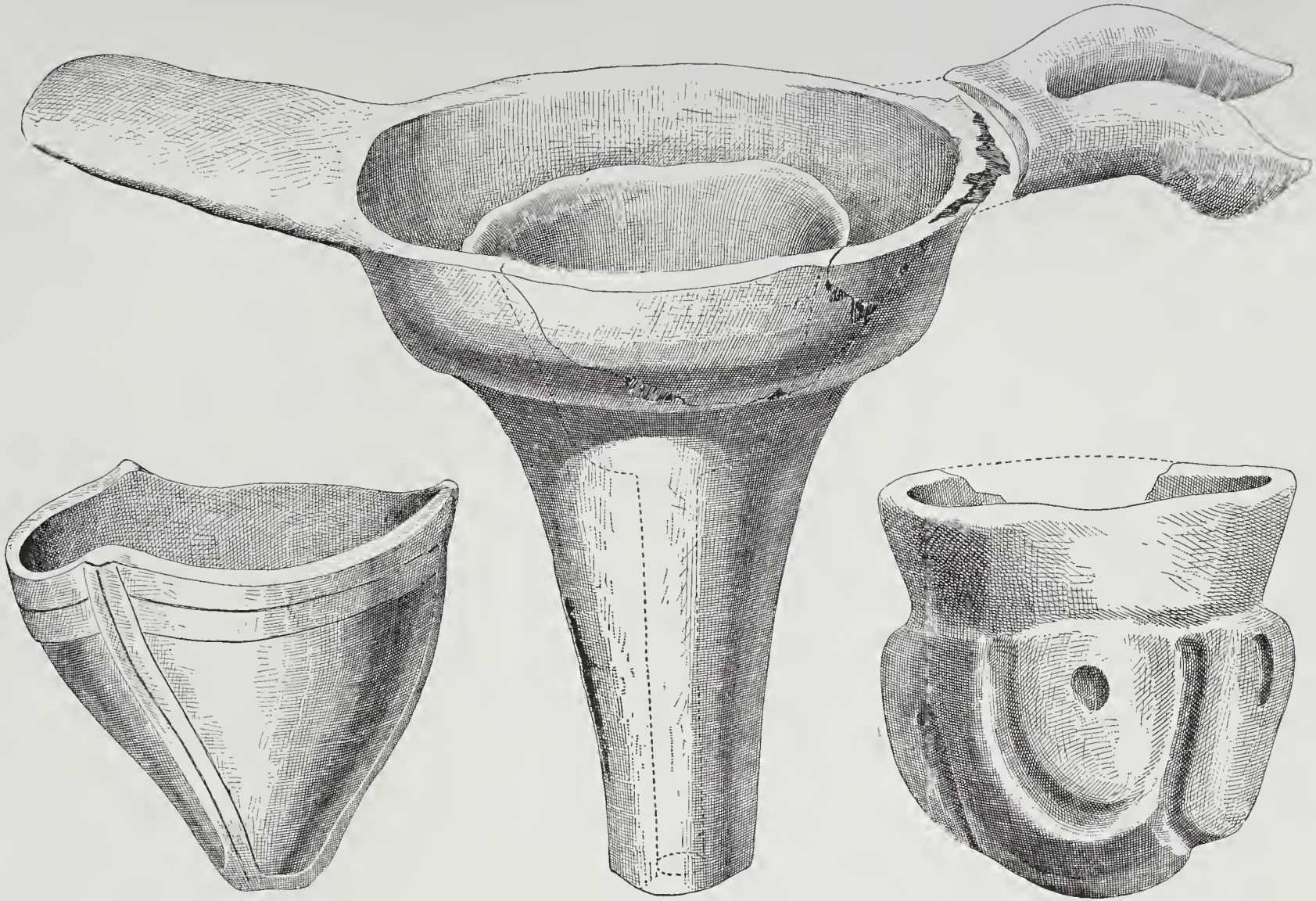


d (DIAMETER 4 INCHES)

RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

(MOORE COLLECTION)

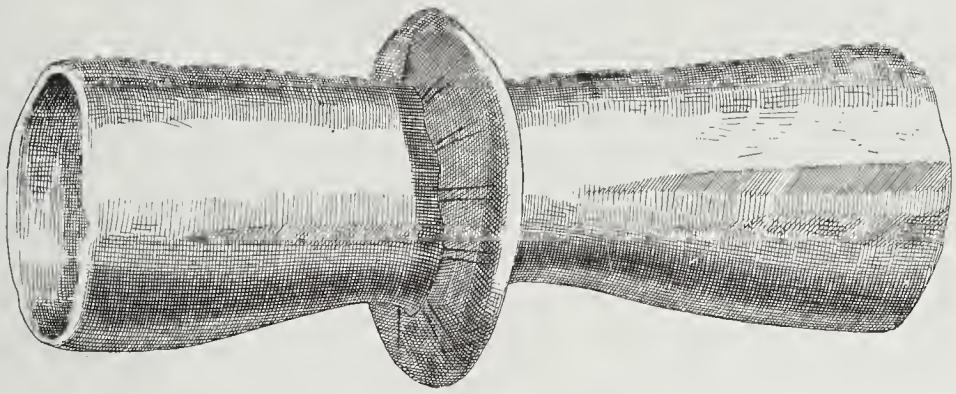


b *a* *c*

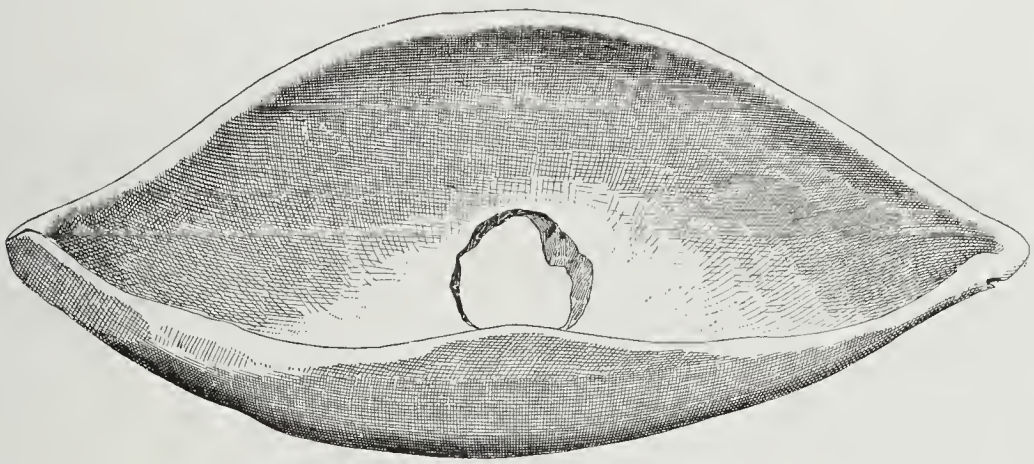
RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

(MOORE COLLECTION)



a (LENGTH 5¼ INCHES)



b (LENGTH 6 INCHES)

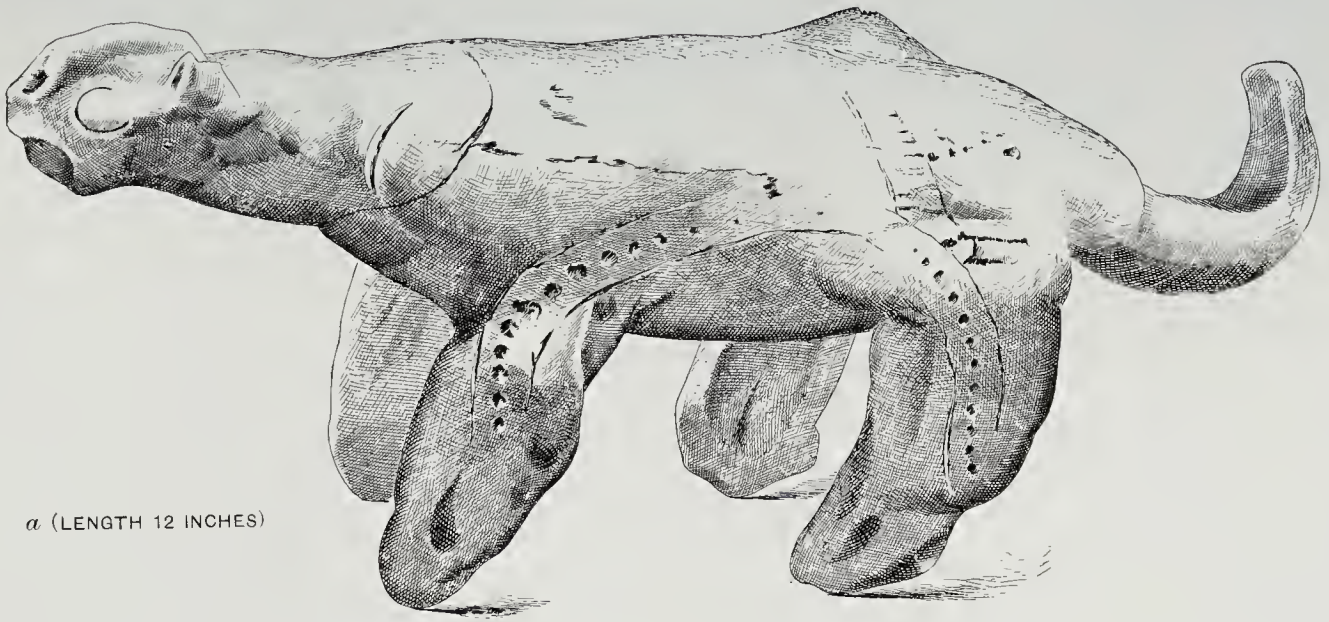


c (LENGTH 6½ INCHES)

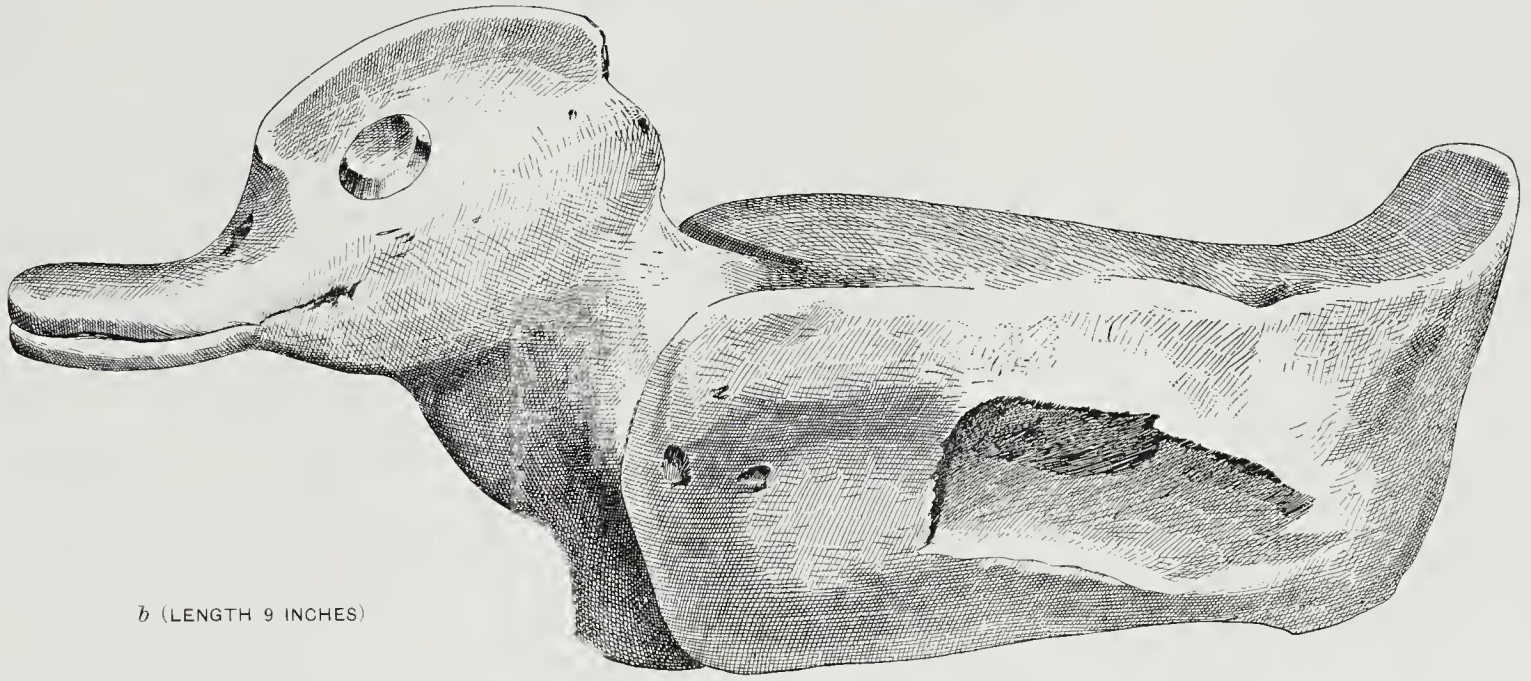
RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

(MOORE COLLECTION)



a (LENGTH 12 INCHES)



b (LENGTH 9 INCHES)

RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

(MOORE COLLECTION)



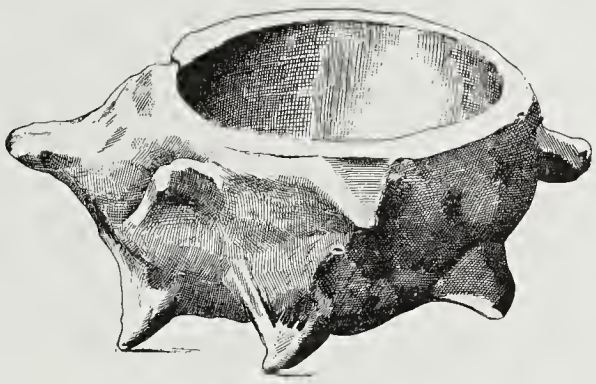
RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

(MOORE COLLECTION, ABOUT THREE-FOURTHS)



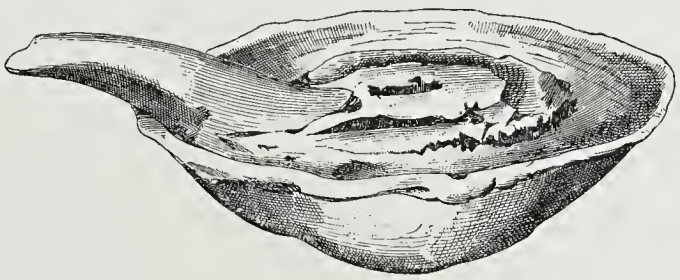
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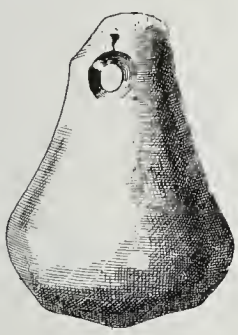
b



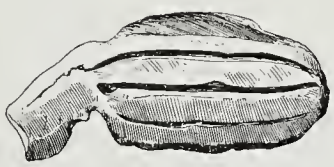
c



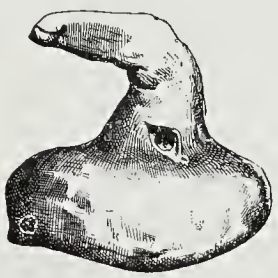
d



e



f



g



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i



j



k

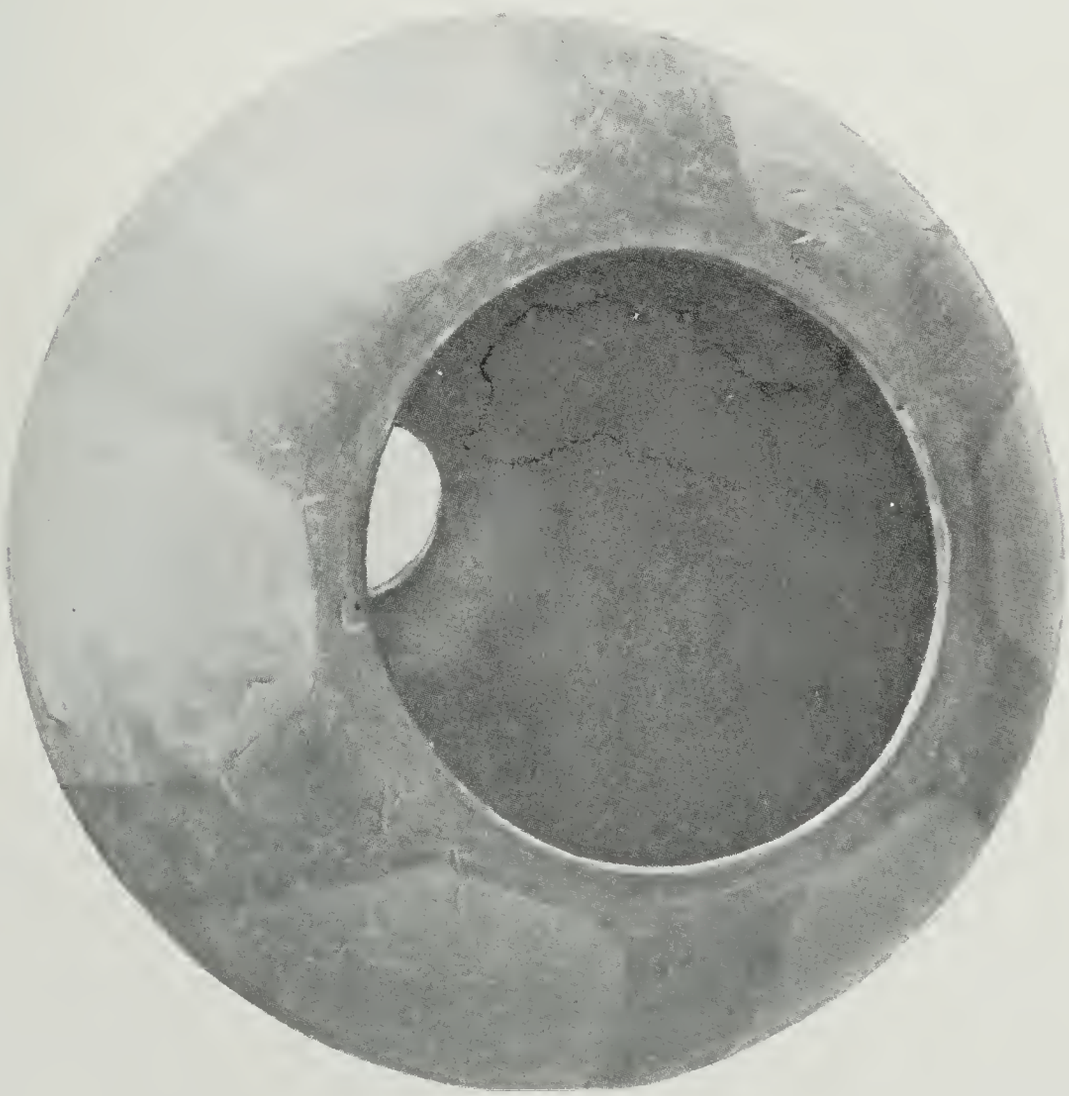
RUDE EARTHENWARE FROM GRAVES

FLORIDA PENINSULA

(MOORE COLLECTION, ABOUT THREE-FOURTHS)



a

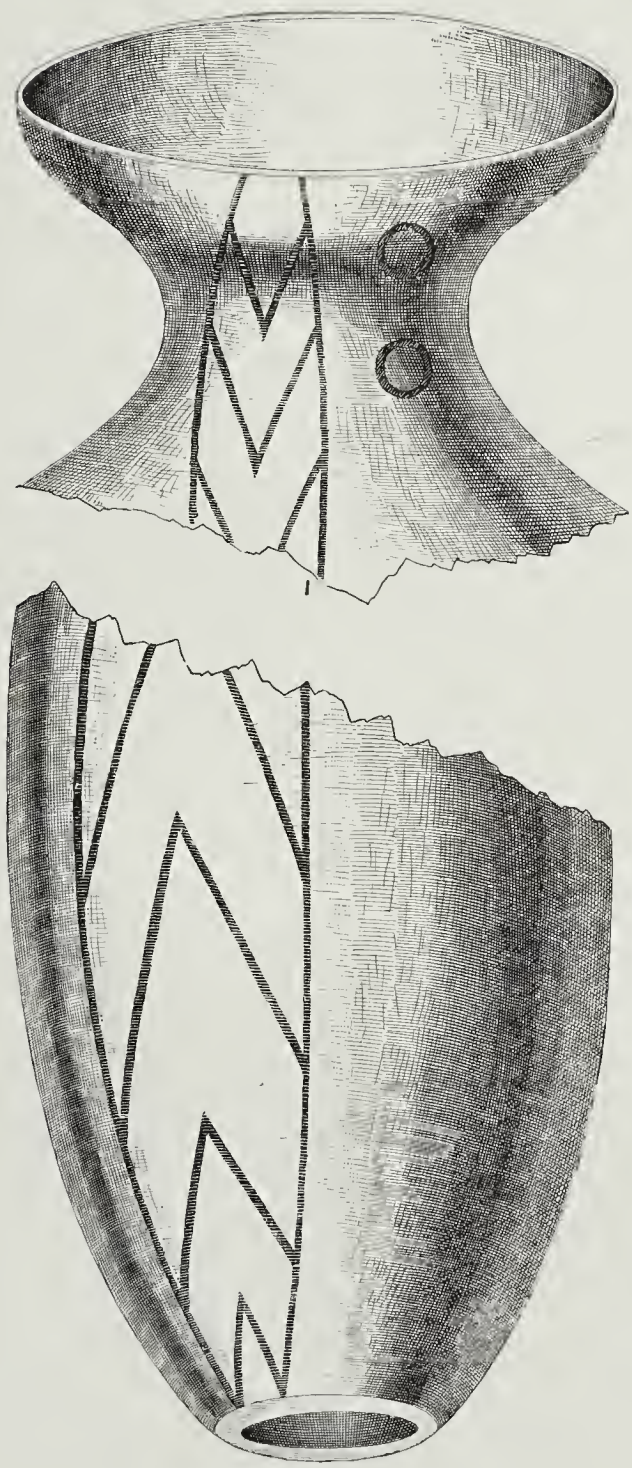


b

LARGE PAINTED VESSEL WITH OPEN BASE

FLORIDA PENINSULA

(MOORE COLLECTION, DIAMETER 19 INCHES)



FRAGMENTS OF PAINTED VESSEL WITH OPEN BASE

FLORIDA PENINSULA

(MOORE COLLECTION, DIAMETER OF LARGE APERTURE 8 INCHES)

are many features of the ware that approach in appearance or manner of treatment the ordinary pottery, and, in fact, there is such a complete grading into vessels of normal character that in places no line can be drawn separating the trivial from the serious. We may therefore safely infer that all varieties were made by potters of the same period and linguistic family. In appearance these articles are rather new-looking, and, being found generally near the surface, may be regarded as representing a comparatively recent period. Examples of several varieties are brought together in plates XCI–XCVIII.[a]

PAINTED WARE OF THE ST JOHNS

The use of colors in decoration prevailed most decidedly in the Middle Mississippi Valley province, but in Florida color was in somewhat general use. Commonly the red color was spread over the entire surface and polished down, as it was in the West. When designs were used, they were always simple, and, in the main, consisted of broad bands in clumsy geometric arrangements. It is not known that color was confined to any particular class of vessels. A very large and remarkable piece of the painted ware is presented in plate XCIX. It was obtained by Mr Clarence B. Moore from a sand mound near Volusia, Volusia county, and is 19 inches in diameter and 15½ inches in height. The base or smaller end is neatly perforated, as may be seen in the lower figure, the opening having been made when the vessel was modeled, and finished with the same care as was the mouth. It is possible that this vessel had some special domestic use in which the perforation was an essential feature, as in straining liquids, or it may have been a drum; but the practice of perforating vessels for burial and of making toy-like vessels with perforated bottoms for mortuary purposes offers an explanation of the significance of the whole class of perforate objects. It is surmised that the native theory was that a vessel which had only a supernatural purpose was properly perforate. It was never endowed with the powers and qualities of a living thing. The red color is applied in broad bands encircling the apertures and in four vertical stripes connecting these. Fragments of a vessel of similar design are given in plate C. It also is from the mound near Volusia, and has been some 18 or 20 inches in length.

POTTERY OF THE WEST COAST

The several varieties of pottery described as occurring in the San Juan province, with the exception of the midden and mortuary ware, are found scattered over the state in mounds and on residence sites, but few examples have found their way into our museums. In the west, and especially along the west coast of the peninsula, other interesting

[a] Recent collections made by Mr Moore in the Apalachicola region show equally novel and varied shapes of this general class, the work being of much higher grade.

varieties of products are encountered. The most striking of these is characterized by its style of ornamentation, which consists of elaborate designs worked out largely with indentations or punctures instead of with plain incised lines, giving tattoo effects. Specimens in the main fragmental have been found over a wide area, but the best preserved and most typical examples are those recently obtained from a burial mound at Tarpon Springs by Mr F. H. Cushing. Some of these are presented in the accompanying plates, and the ornamental designs are projected at full length in plate CIV. Notwithstanding the large degree of individuality displayed by these specimens, they by no means stand alone, being closely allied in paste, shape, and ornamentation to one or another of the varieties of Florida pottery.

The vase shown in plate CI is perhaps the most interesting and artistic of the group. The lower figure gives a top view of the shattered vessel as it appeared when the various pieces were first hastily set together, while the upper shows it as restored by Mr Cushing, save in one respect, namely, that as in his restoration the base is more delicately pointed than seems warranted by any model found in Florida, the liberty of changing it has been taken, the bottom being given a gently rounded or slightly flattened outline, as if the vessel had been intended to stand alone. The color is a yellowish terra cotta, the surface is even and well polished, and the walls are very thin. The incurved rim is narrow and rounded on the margin and is embellished with four conic nodes placed at equal distances about the lip. The decoration, which is applied and worked out in a very pleasing and artistic manner, appears in plate CIV*a*. Although it is highly conventional, it is undoubtedly significant and symbolic, and is based on some life form. It is seen that the leading feature of the design is repeated four times above a broad meander band which encircles the body of the vessel, and that below the band a second and less elaborate feature is also four times repeated. As we recall the usual association of animal features with vases in the general region, we examine the design to discover, if possible, some suggestion of a life concept. It would seem that the leading elements of the design must represent the head of some creature, and by studying the four principal features, it is seen that they show decided analogies with more realistic delineations of the duck observed on other vessels, and the conclusion is reached that the device is a conventional treatment of this favorite concept and that the vessel was invested with appropriate life symbolism by the people to whom it belonged.

A second specimen from the Tarpon Springs mound is given in plate CII*a*. It is quite equal to the other in delicacy of execution and in interest, and the exquisite design shown in full in plate CIV*b* may be looked on as of the same class as the preceding and as intended to symbolize nothing more esoteric or mysterious than the life idea



a



b

DECORATED VASES, TARPON SPRINGS

FLORIDA PENINSULA

(FREE MUSEUM OF SCIENCE AND ART, PHILADELPHIA, DIAMETER 13 INCHES)



c *b*



a (DIAMETER 13⅛ INCHES)

VASES WITH ENGRAVED DESIGNS, TARPON SPRINGS

FLORIDA PENINSULA

(FREE MUSEUM OF SCIENCE AND ART, PHILADELPHIA)



a

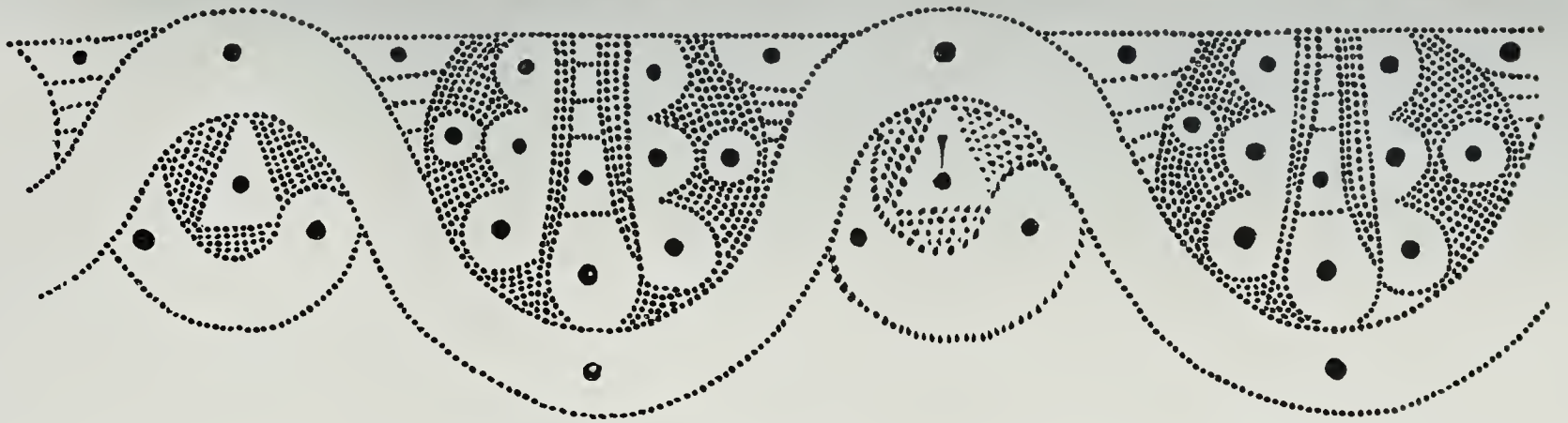


b

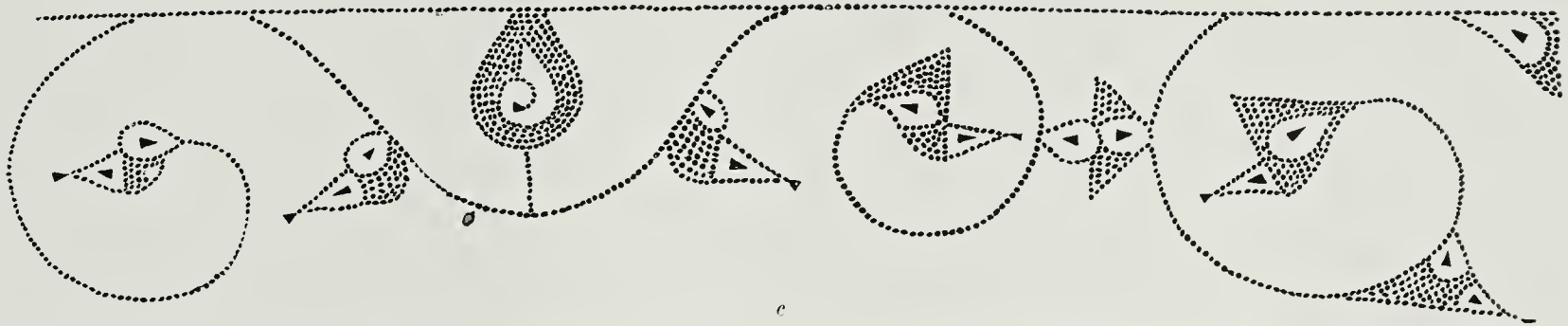
VASES WITH ENGRAVED DESIGNS, TARPON SPRINGS

FLORIDA PENINSULA

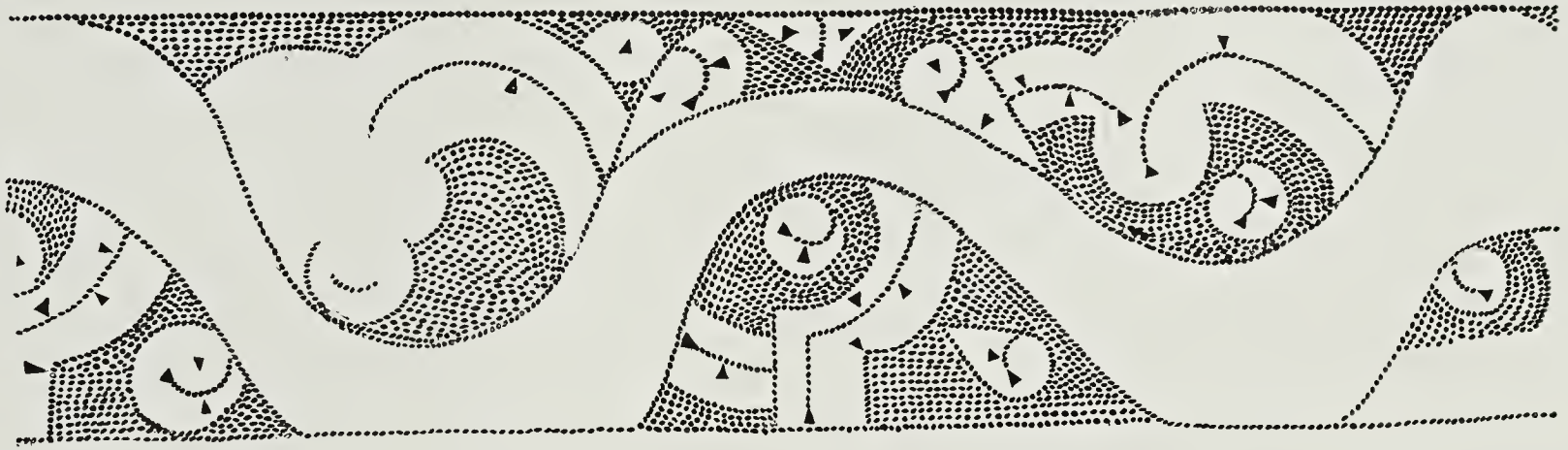
(FREE MUSEUM OF SCIENCE AND ART, PHILADELPHIA, DIAMETER 8 INCHES)



a



c

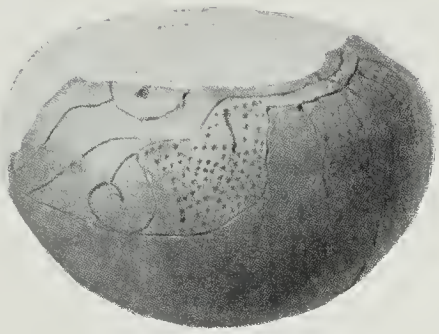


b

ENGRAVED DESIGNS, TARPON SPRINGS

FLORIDA PENINSULA

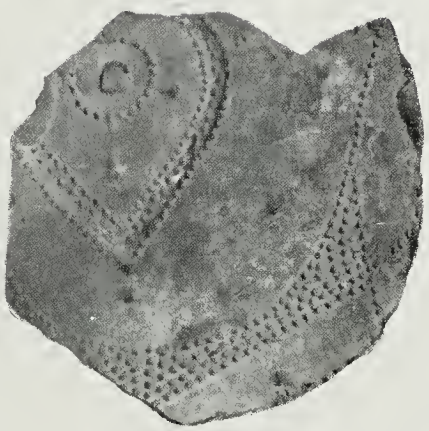
(SEE PLATES CI, CII, CIII.)



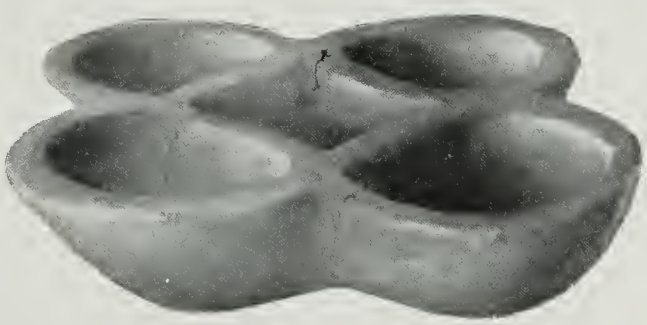
a (DIAMETER 3¾ INCHES)



b (ABOUT ONE-HALF)



c (ABOUT ONE-HALF)



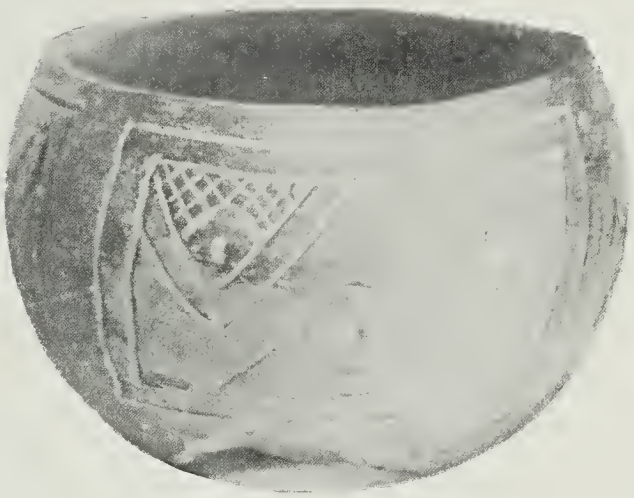
d (DIAMETER 5½ INCHES)

FRAGMENTS OF DECORATED WARE AND COMPOUND CUP

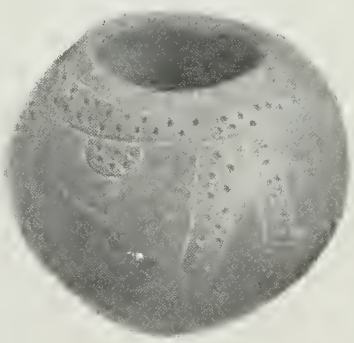
FLORIDA PENINSULA



a (HEIGHT 10½ INCHES)



e (DIAMETER 5½ INCHES)



d (DIAMETER 3¼ INCHES)



b



c

(HEIGHT 9 INCHES)

ENGRAVED AND PAINTED VASES, TARPON SPRINGS

FLORIDA PENINSULA

(FREE MUSEUM OF SCIENCE AND ART, PHILADELPHIA)



CLUSTER OF VASES IN SAND MOUND BURIAL

FLORIDA PENINSULA

associated with the vase in accordance with almost universal custom. It is instructive, however, to observe the graceful ways in which the esthetic instincts of a primitive people have taken hold of the crude elements of symbolism, making them things of beauty.

A third vessel of the same group, similar in shape and finish and embodying analogous elements of decoration, appears in plate CIII and the design is drawn out in plate CIV *c*. This specimen is shown also in the preceding plate, CII, in connection with a large plain pot, *c*, of symmetric shape and excellent surface finish. Two fragments decorated in this stipple style, one showing a graceful shield-shaped figure in relief, are shown in plate CV *b* and *c*. They came from a mound at Cedar Keys. The little cup shown in *a* of this plate is decorated with incised lines and punctures representing a crab-like animal, and also in color, certain spaces being finished in red. It is from Franklin county, Florida.

The same plate includes a remarkable specimen of compound vessel from a mound in Franklin county. It is a plain ware of usual make and has five compartments, four circular basins arranged about a central basin of squarish shape. One of the encircling basins has been broken away and is restored in the drawing.

One of the most novel forms is shown in plate CVI *a*. It is goblet-like and is open at both ends, reminding one of the Central American earthenware drums. It appears, however, from a careful examination, that the base was originally closed or partly closed, and that the end was broken out and the margin smoothed down so that in appearance it closely resembles the larger open end. The surface is embellished with broad bands of red and incised figures, all probably highly conventionalized animal features. A similar specimen embellished with unique incised patterns is shown in *b* and *c* of the same plate.

In plate CVII a bunch of four vessels, as exposed while excavating a grave in a sand mound at Tarpon Springs, is shown. Still other specimens of inferior size and make, also from Tarpon Springs, are similar in style to the pieces already illustrated, while some are small, rude, and quite plain or decorated with crude designs, and a few are modeled in imitation of gourds, seashells, and animals. In some cases compound and eccentric forms are seen. One medium-sized pot-like form, suggesting a common western type probably intended to stand for some life form, has a rudely incised design encircling the shoulder and four looped handles placed at equal distance about the neck. Occasional specimens are tall, and have the wide mouth and conic base so characteristic of the Appalachian region, and these are ornamented with the patterned stamp in various styles. Fragments from Tarpon Springs showing the florid stamp designs are given in plate CVIII, and griddle patterns appear in plate CIX.

The pottery secured by Mr Cushing at San Marco on the Pile-

dwelling sites, and associated with remains and relics of the most remarkable kind,[a] is extremely simple in style, hardly excelling in its plastic and graphic features the gourd and wooden vessels found in such profusion in the muck-filled canals and, in many cases, it appears to be modeled in imitation of these vessels. It does not differ in kind from the ordinary West Florida ware, however, which indicates the practical identity of the Pile-dwellers with other occupants of the region in time and culture.

Somewhat common in the western and northwestern peninsular region is another variety of decorative treatment related to the delicate engraved work described above, but contrasting strongly with it. The designs in cases duplicate the peculiar scroll work of the Mobile-Pensacola district, and again are somewhat like the Tarpon Springs scroll work. The main peculiarity is that the lines are wide and are deeply incised, as is shown in plate CX *a*, *b*, *c*. In *b*, which is part of a large globular bowl, the figures are outlined in deep, clean lines, and some of the spaces are filled in with stamped patterns consisting of small checks, giving very pleasing results. In *a* and *c* some of the spaces are filled in with indentations made with a sharp point. Handled vessels—dippers, cups, and pots—are common, and it is not unusual to see the rim of a pot set with four or eight handles; *e* illustrates this feature and also a treatment of the scroll much like that prevalent farther up the west coast. There are traces along this coast of rather pronounced variations in composition, shape, and decoration. A number of sherds illustrating the varied decorative effects produced by pinching with the finger nails are illustrated in *f*, *g*, and *h*.

ANIMAL FIGURES

It is not uncommon to find in many parts of Florida, and especially along the Gulf coast, portions of fairly well modeled animal figures, mostly only heads, which originally formed parts of bowls and other vessels. These correspond very closely with similar work in the West, and are almost duplications of the heads found in the Pensacola region. The detached heads have been found as far south as Goodland point, San Marco island, where Mr Moore picked up two specimens that had evidently been made use of as pendants, probably on account of some totemic or other significance attached to them. Mr Cushing also found one of these bird-head amulets in the canal deposits at San Marco. All are of western types, and may have been brought from north of the Gulf. On the whole, the employment of animal figures in the art of Florida, as well as of the Atlantic coast farther north, seems a late innovation, and the practice of embellishing vessels with these features has probably, in a large measure, crept in from the West.

[a] Cushing, F. H., Exploration of ancient key-dweller remains, Proceedings of the American Philosophical Society, vol. XXXV.



POTSHERDS WITH ORNATE STAMP DESIGNS

FLORIDA PENINSULA

(ABOUT ONE-HALF)



POTSHERDS WITH GRIDDLE-LIKE STAMP DESIGNS

FLORIDA PENINSULA

(ABOUT ONE-HALF)



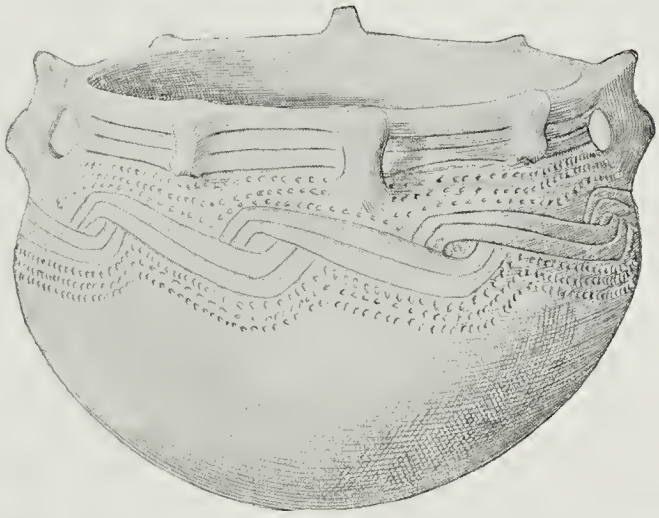
a



b



c



e (DIAMETER 6 INCHES)



f



g



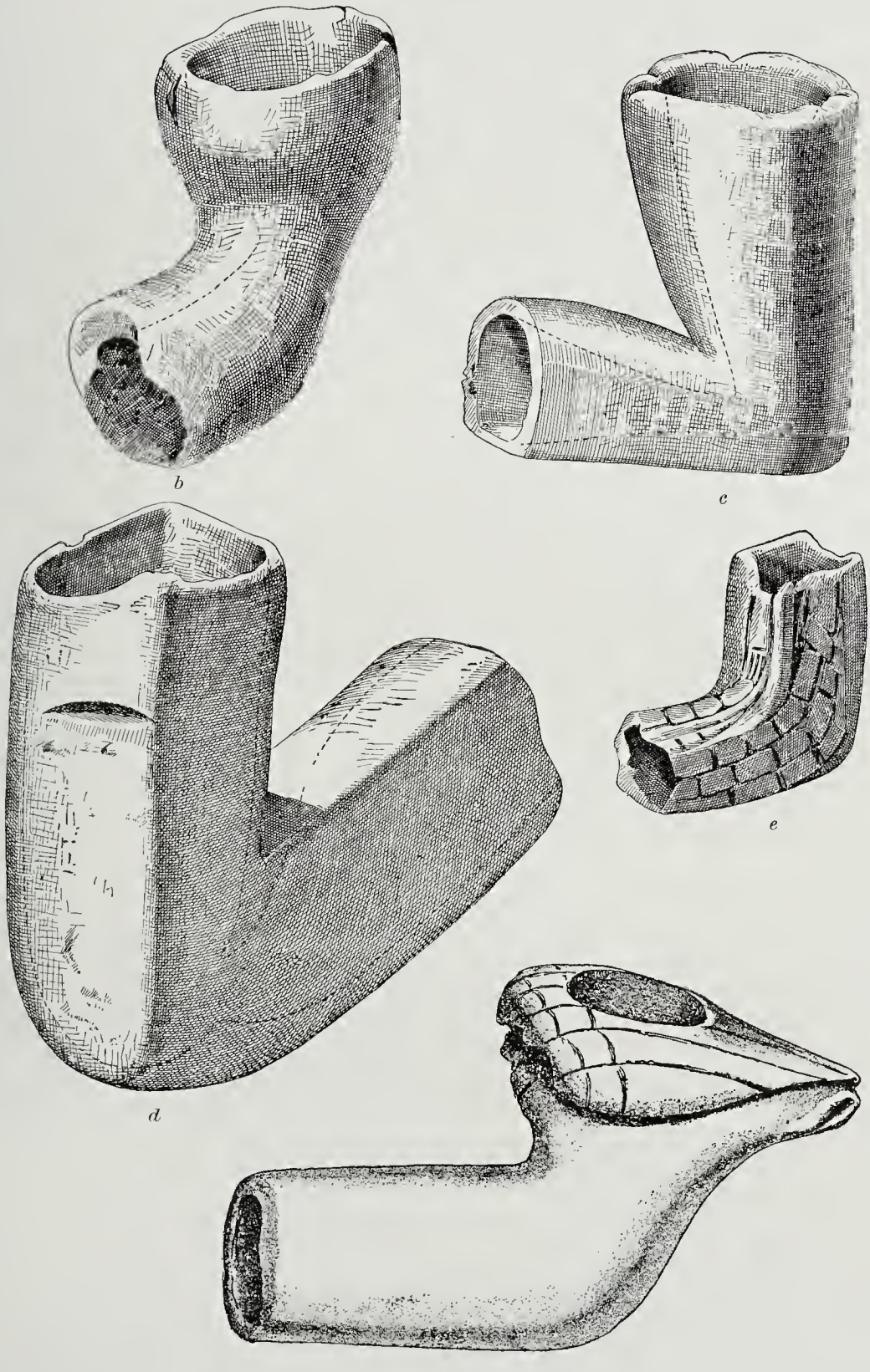
d



h

HANDLED CUP AND VARIOUS SHERDS FROM THE WEST COAST

FLORIDA PENINSULA



TOBACCO PIPES

FLORIDA PENINSULA

(MOORE COLLECTION, ABOUT THREE-FOURTHS)

TOBACCO PIPES

Tobacco pipes of earthenware are quite rare in Florida. The specimens figured in plate CXI are types, *a* being embellished with the imperfect figure of a bird resting on the bowl and perforated by the bowl cavity, while *b* is undecorated. Other specimens appear in *c*, *d*, and *e*. In general shape they correspond closely with the prevailing heavy-bodied pipes of the South and West. Only one entire specimen and two fragments have been reported from shell heaps.

SPANISH OLIVE JARS

From time to time collectors have reported the finding of pottery in Florida and other southern states bearing evidence of having been turned on a wheel, and also showing traces of a brownish glaze. Examination always discloses the fact that the ware is of Spanish manufacture. The

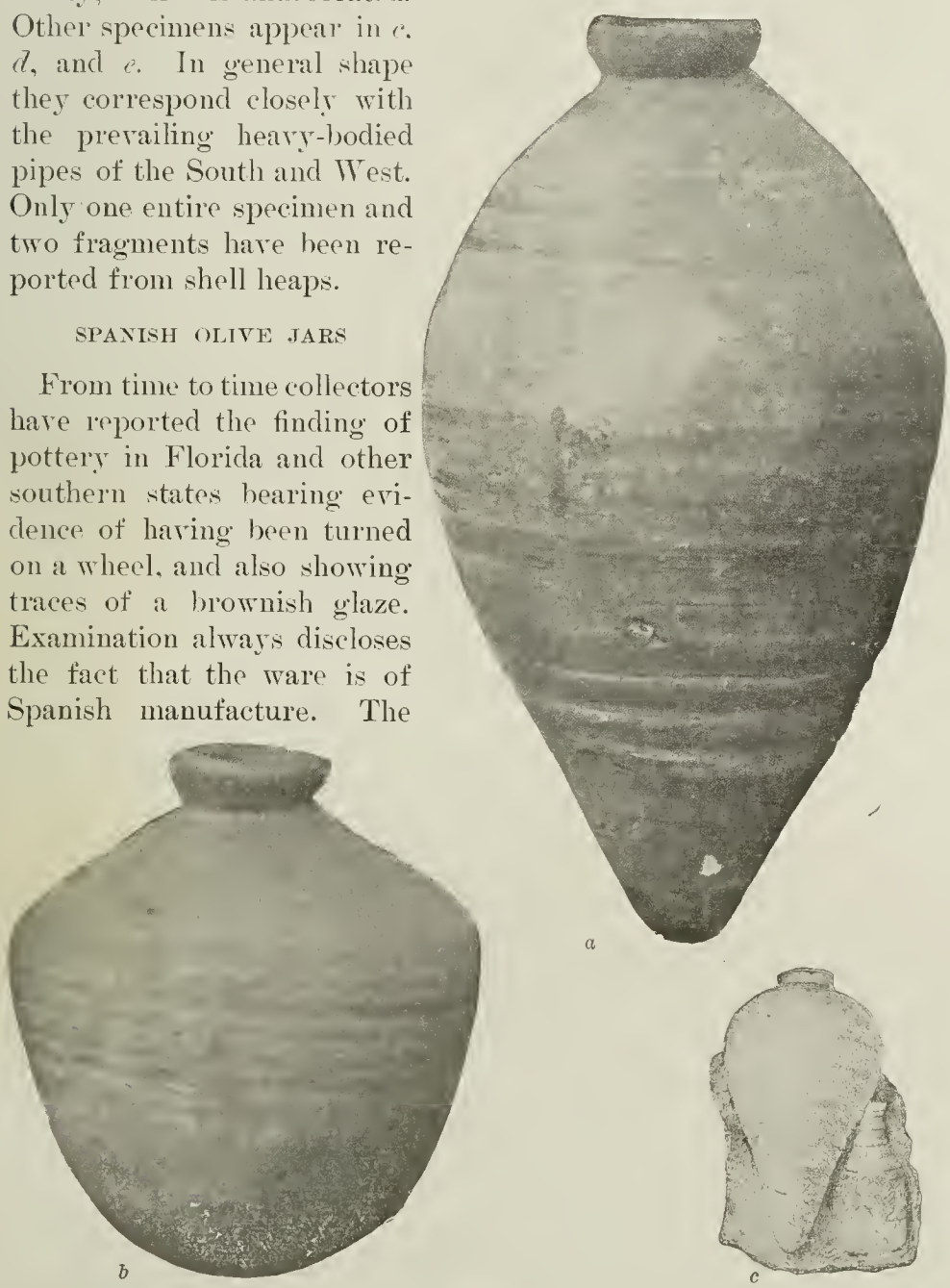


FIG. 59—Spanish olive jars, Florida.

paste is that of ordinary terra cotta, and in cases is burned quite hard, resembling stoneware. The forms are little varied, the short bottle neck and the long-pointed base being notable characteristics. The encircling ribs left by careless throwing on the wheel are often quite

pronounced. In numerous cases the inside of the lip has received a yellowish glaze. Occasionally these vessels are recovered from Indian mounds. In early times it was a common practice to ship olives to America in earthen jars of this class. Illustrations are given in figure 59. A very interesting specimen of this ware, figure 59*c*, may be seen in the Natural History Museum at Boston. It is a jar with long, attenuated, conic base, which, with a glass bottle, was found embedded in a mass of coral obtained by dredgers from a coral reef off Turks island at the point where the British frigate Severn is said to have been wrecked about the year 1793. In a few instances very large and thick vessels of terra cotta have been reported, which are probably of European origin, and an antique bath tub of glazed earthenware was recently unearthed in one of the Gulf states.

POTTERY OF THE SOUTH APPALACHIAN PROVINCE

Extent of the Province

A culture province of somewhat marked characteristics comprises the states of Georgia, South Carolina, and contiguous portions of Alabama, Florida, North Carolina, and Tennessee. On the arrival of the whites a large portion of this area was occupied or overrun by the Creek Indians or their congeners, now included by Major Powell under the head of the Muskhogean linguistic family. The early explorers of this region referred to the tribes encountered as "Apalachee," and the name Appalachian has been given by our geographers to the range of mountains that extends into the area from the north. The designation of the culture area is therefore historically and geographically appropriate. The general area over which the pottery of this group is distributed is indicated in the accompanying map, plate IV.

Prevailing Types of Ware

The ceramic phenomena of this province include one great group of products to which has been given the name South Appalachian stamped ware, and also several less distinctly marked varieties, belonging, in the main, to groups typically developed in neighboring areas. Of these overlapping varieties the Florida and Gulf Coast groups on the south, the middle Mississippi valley group on the west, and other less striking varieties on the north and east may be mentioned. Tribes of at least three of the stocks of people inhabiting this general region continued the practice of the potter's art down to the present time. The Catawbas and Cherokees are still engaged to a limited extent in pottery making; and the Choctaws, Chickasaws, and Seminoles have, if the labeling of certain specimens now in the National Museum is correct, but recently abandoned the work. The manufacture of earthenware by the two first-mentioned tribes is described in the introductory pages of this paper, and illustrations are presented in this section.

Among the more noteworthy features of the ancient ceramic art of this province are the novel shapes of some of the vessels, the peculiar style of their decoration, the intermingling of local and what appear to be exotic forms, and, lastly, the very common use of vessels as receptacles for remains of the dead. A rare and exceptional feature of decoration, described by Colonel C. C. Jones and others, is the use of bits of shell and bright stones in inlaying. These bits were set in decorative arrangements into the clay while it was yet plastic—an art practiced to a limited extent at the present day by primitive peoples on both continents, but never rising to a place of importance.

The principal fictile product of the province was the large caldron or cook pot, although bowls were used and fancifully shaped vessels are sometimes encountered. Small figurines and tobacco pipes were made in considerable numbers, and potsherds were often cut into discoid shapes, perhaps for playing games of skill or chance.

The remains of what are supposed by some observers and writers to be primitive pottery kilns have been reported, but the evidence is not conclusive in any case.

The most striking variety of earthenware found within the limits of the Atlantic drainage is distributed very generally over Georgia and contiguous portions of all the adjoining states. For convenience of designation it has been called the South Appalachian stamped ware. Many of the more typical specimens in our collections came from the valley of the Savannah. The most strongly marked characteristics of this ware are its material, which is generally hard, heavy, and coarsely silicious; its shapes, the most notable of which is a deep caldron with conic base and flaring rim; and its decoration, which consists in great part of stamped figures of no little technic and artistic interest.

This stamped pottery is obtained from mounds, graves of several classes, village sites, and shell heaps. In some localities it is associated with remains of distinct varieties of ware, but in others it seems to occur alone. This intermingling of different varieties is not confined to village sites and shell heaps where accident could have brought the different sorts together, but is common in mounds whose contents appear to have belonged to a single community. Whether the different kinds of pottery originated with a single people, or whether the association is the result of the amalgamation of distinct groups of people, can not be determined. The area over which the sherds are scattered is so wide that we can hardly connect the manufacture of even the more typical forms with any single tribe or group of tribes. It is distributed over areas occupied in historic times by numerous stocks of people, including the Algonquian, Iroquoian, Siouan, Muskhogean, and Timuquanan. Of these groups the Muskhogean probably has the best claim to the authorship of this ware. The modern Catawbas (Siouan) and Cherokees (Iroquoian), especially the

latter, make vessels corresponding somewhat closely to those of Muskhogean make in some of their features, but these features may have been but recently adopted by them. In the region producing type specimens, the material, shape, and ornament are so distinctive as unitedly to give the ware great individuality; but in other localities less typical forms are found to occur. In some sections the material changes, and we have only the shapes and decoration as distinguishing features, while in others we must depend on the decoration alone to indicate relationship with the type forms.

Materials and Color

Usually the paste is hard and heavy, consisting of clay tempered with a large percentage of quartz sand or pulverized quartz-bearing rock. Occasional specimens from the Eastern Shore are tempered with shell. In color this pottery is of the normal gray and brownish hues of the baked clay.

Form and Size

The vessels of this group are well built, and have even, moderately thick walls and fair symmetry of outline. The shapes are not greatly varied as compared with other southern and with the western groups. There are bowls, shallow and deep, mostly of large size, having both incurved and recurved rims. There are pots or caldrons ranging from medium to very large size, the largest having a capacity of 15 or 20 gallons. The form varies from that of a deep bowl to that of a much lengthened subcylindric vessel. The base is usually somewhat conic, and in the bowls is often slightly truncated, so that the vessels stand upright on a flat surface.

Uses

As a rule the larger pieces show indications of use over fire, and it is not improbable that this stamped ware was largely the domestic or culinary ware of the peoples who made it, and that other forms less enduring, and hence not so frequently preserved, except in fragments, were employed for other purposes. This view would seem to be confirmed in some degree by the occurrence of smaller and more delicate vessels distinct in shape and decorative treatment along with the stamped ware on village sites and in some of the mounds opened by the Bureau of American Ethnology. Some of these vessels, however, are so very distinct in every way from the stamped pottery, and are so manifestly related to groups of ware in which stamped designs, conic forms and quartz tempering were unusual, that we may regard them tentatively as exotic

The preservation of the culinary utensils elsewhere almost universally found in fragments is due to their utilization for mortuary purposes. In no other province, perhaps, was the custom of burying the



a (DIAMETER 12 INCHES)



b (DIAMETER 11⅛ INCHES)

BURIAL VASES WITH COVERS,

SOUTH APPALACHIAN GROUP

dead in earthen vessels so common as it was in the South Appalachian. Generally the bones are charred, and in many cases they belong to children. Apparently it was not customary to make vessels exclusively for burial purposes, although in some cases the bowl cover was constructed for the purpose. Generally the mortuary vessel stood upright in the grave, but in some instances a large wide-mouthed vase was filled with bones and inverted, and in a few cases bowls have been found inverted over skulls or heaps of bones.

In plate CXII we have illustrations of the manner in which these vessels were employed in burial. A bowl with incurved rim of a size to fit the mouth of the pot was set into it in an inverted position as a cover, as is shown by *a*. This specimen is from a mound near Milledgeville, Georgia. A vase of different type is shown in *b*. It was obtained from a mound in Chatham county by Mr E. H. Hill, and is covered with a small bowl exactly fitting the cone-shaped top of the vase. Colonel C. C. Jones[a] gives a careful description of the discovery in a mound on Colonels island, Liberty county, Georgia, of a burial vase with a lid of baked clay shaped to fit neatly. A smaller vessel containing the bones of an infant had been placed within the larger one. The larger vessel apparently differed from those found farther inland in having been covered with textile imprints, and in having a slight admixture of shell tempering. In these respects it resembled the typical pottery of the Atlantic seaboard, affiliating with the Algonquian wares of the Middle Atlantic province.

Decoration

As has been mentioned, the remarkable style of decoration, more than any other feature, characterizes this pottery. Elaborately figured stamps were rarely used elsewhere, except in Central and South America. The exact form of the stamping tool or die is, of course, not easily determined, as the imprint upon the rounded surface of the vases represents usually only the middle portion of the figured surface of the implement. It is highly probable, however, that the stamp had a handle and therefore assumed the shape of a paddle, as do the stamps used by the Cherokees at the present time. Occasionally partial impressions of a small portion of the square or round margin of the stamp are seen. It was the usual practice to apply the stamp at random over the entire exterior surface of the vessel, and thus it happened that the impressions encroached upon one another, rendering an analysis of the design, where it is complex, extremely difficult. In many localities the design was simple, consisting of two series of shallow lines or grooves crossing the paddle surface at right angles, leaving squarish interspaces in relief, so that the imprint on the clay gave

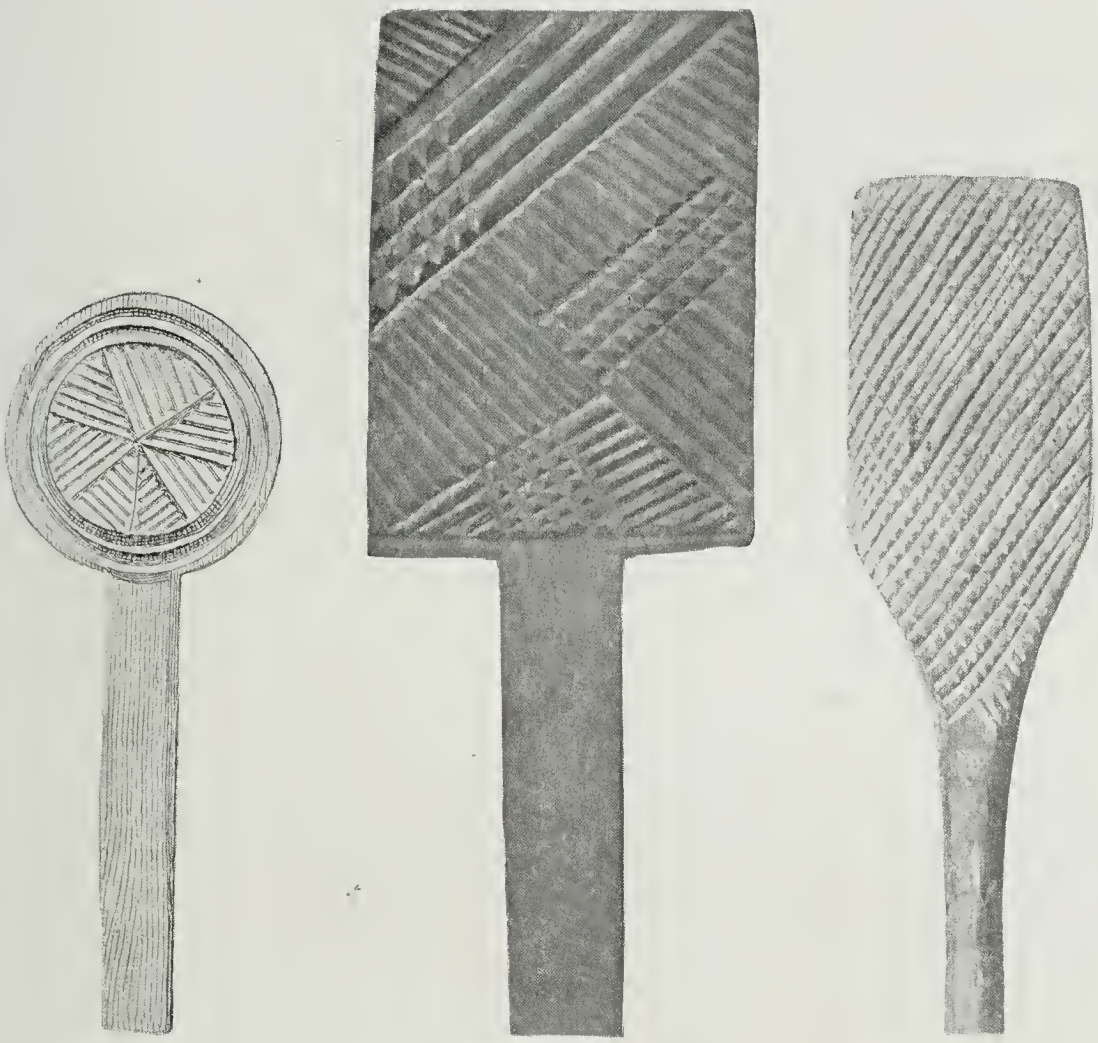
[a] Jones, Charles C., Antiquities of the Southern Indians, New York, 1873, p. 455.

the reverse—that is, low ridges with shallow rectangular depressions in the interspaces. The lines vary from 3 to 10 to the inch, and, when covering the surface of a vessel, give a hatched or checkered effect closely resembling that made by imprinting a coarse fabric or a cord-wrapped tool. These figures have occasionally been regarded as impressions resulting from modeling the vessel in a basket or net, but close examination shows that the imprintings are in small, disconnected areas, not coinciding or joining at the edges where the impressions overlap, and that the arrangement of parts is really not that of woven strands.

The character of the work is fully elucidated by the Cherokee wooden paddles which are shown in plate CXIII *a*, *b*, *c*. One side of the broad part of the implement is covered with deeply engraved lines, carved no doubt with steel knives, but the work is not so neat and the grouping is not so artistic as in the ancient work. The effect produced by the use of such an implement is illustrated in *d*, a modern Cherokee pot, collected in 1889 by Mr James Mooney, and referred to already under the head Manufacture.

Where an intricate design was employed the partial impressions from the flat surface of the paddle are so confused along the margins that in no case can the complete pattern be made out. By a careful study of a number of the more distinct imprints, however, the larger part of the designs may be restored. For several years rubbings of such imprintings as came to hand have been taken, and some of the more interesting are presented in plate CXIV. They consist, for the most part, of curved lines in graceful but formal, and possibly, as here used, meaningless combinations. By far the most common figure is a kind of compound filfòt cross, swastika, or Thor's hammer—that is to say, a grouping of lines having a cross with bent arms as a base or center, shown in *a* and *b*. The four border spaces are filled in with lines parallel with the curved arms of the central figure. The effect of this design, as applied to the surface of a fine large vessel from a mound on the Savannah river 10 miles below Augusta, is well shown in plate CXV *a*. Another excellent example is seen in plate CXVI.

An interesting result of my recent studies of the pottery of the region, referred to in the preceding section, is the observation that the designs stamped on the clay are in many cases closely analogous to designs used by the ancient insular Caribbean peoples. Many of the latter designs are engraved on utensils of wood, and the Appalachian stamps on which the designs were carved were likewise of wood, which suggests contact or intimate relationship of the peoples in ancient times. There can hardly be a doubt that Antillean influence was felt in the art of the whole southeastern section of the United States, or that, on the other hand, the culture of the mainland impressed itself strongly on that of the contiguous islands. A comparison of the



a (LENGTH 9¾ INCHES) *c* (LENGTH 9½ INCHES) *b*



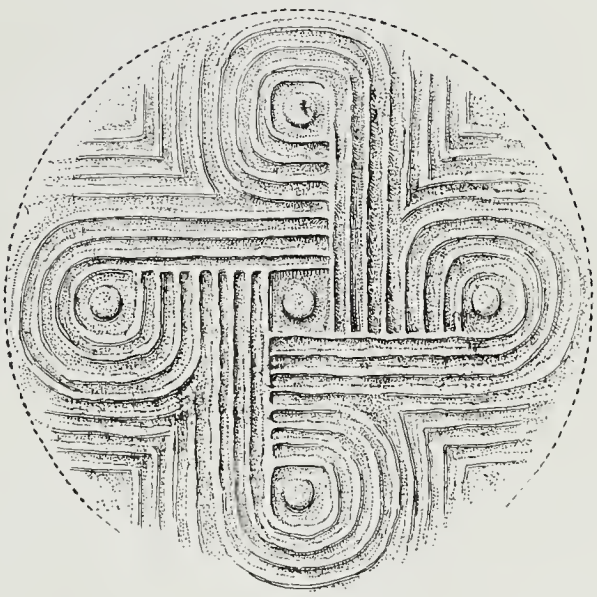
d (DIAMETER 10 INCHES)

CHEROKEE STAMP-DECORATED POT, AND PADDLE STAMPS

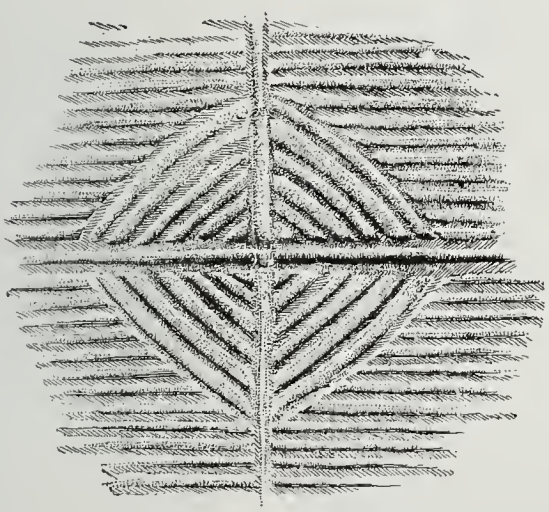
SOUTH APPALACHIAN GROUP



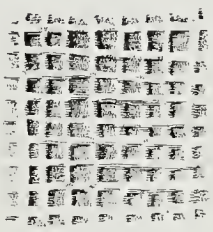
a



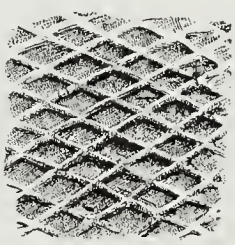
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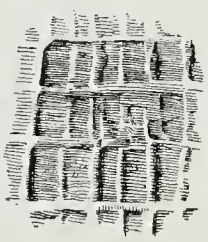
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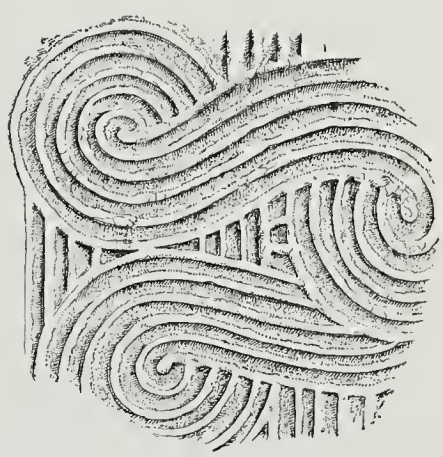
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i



d



e

STAMP DESIGNS RESTORED FROM IMPRESSIONS ON VASES

SOUTH APPALACHIAN GROUP

stamped designs illustrated in plate CXIV with others of Florida and Guadeloupe island, given in a recent publication,[a] will make the analogies apparent.

The stamped ware is found plentifully throughout the state of Georgia and as far west along the Gulf coast as Mobile bay. Stamp designs constitute the prevailing decoration in the wares of Early county, southwestern Georgia. In eastern Tennessee, at a few points on the eastern side of the valley of the Tennessee river, examples varying considerably from the Savannah type have been observed. The vessels are generally intermingled with western forms of pottery. North Carolina furnishes some stamped ware, and in South Carolina stamped ware appears to be the prevailing variety. On the Florida peninsula this ware seems to have lost some of its most typical characters, the vessels having different shapes and the stamp designs consisting mainly of simple reticulations.

Although some of the peculiar designs with which the paddle stamps were embellished may have come, as has been suggested, from neighboring Antillean peoples, it is probable that the implement is of continental origin. It is easy to see how the use of figured modeling tools could arise with any people out of the simple, primitive processes of vessel modeling. As the walls were built up by means of flattish strips of clay, added one upon another, the fingers and hand were used to weld the parts together and to smooth down the uneven surfaces. In time various improvised implements would come into use—shells for scraping, smooth stones for rubbing, and paddle-like tools for malleating. Some of the latter, having textured surfaces, would leave figured imprints on the plastic surface, and these, producing a pleasing effect on the primitive mind, would lead to extension of use, and, finally, to the invention of special tools and the adding of elaborate designs. But the use of figured surfaces seems to have had other than purely decorative functions, and, indeed, in most cases, the decorative idea may have been secondary. It will be observed by one who attempts the manipulation of clay that striking or paddling with a smooth surface has often a tendency to extend flaws and to start new ones, thus weakening the wall of the vessel, but a ribbed or deeply figured surface properly applied has the effect of welding the clay together, of kneading the plastic surface, producing numberless minute dovetailings of the clay which connect across weak lines and incipient cracks, adding greatly to the strength of the vessel.

That the figured stamp had a dual function, a technic and an esthetic one, is fully apparent. When it was applied to the surface it removed unevenness and welded the plastic clay into a firm, tenacious mass. Scarifying with a rude comb-like tool was employed in some sections for the same purpose, and was so used more generally on the inner

[a] Holmes, W. H., Caribbean influence on the prehistoric ceramic art of the southern states, American Anthropologist, vol. VII, p. 71.

surface, where a paddle or stamp could not be employed. That this was recognized as one of the functions of the stamp is shown by the fact that in many neatly finished vessels, where certain portions received a smooth finish, the paddle had first been used over the entire vessel, the pattern being afterward worked down with a polishing stone. However, the beauty of the designs employed and the care and taste with which they were applied to the vases bear ample testimony to the fact that the function of the stamp as used in this province was largely esthetic. It may be safely assumed, in addition, that in many cases the figures were significant or symbolic. The use of stamps and stamp-like tools in other regions will be mentioned under the proper headings.

EXAMPLES

VASES

The specimens shown in plate CXV may well be taken as types of the larger vessels of the Appalachian variety. The large vessel *a* is blackened by use over fire, and it not unlikely served the humble purpose of preparing food messes for the family, somewhat after the manner so graphically described and illustrated in Hariot's history of the Roanoke colony,[a] and shown in plate II. It is nearly symmetric, is 16 inches in height and the same in diameter, and has a capacity of about 15 gallons. The paddle-stamp has been carefully used, giving a pretty uniform all-over pattern; the design is shown three-fourths actual size in plate CXIV *a*. The rim is decorated with two encircling lines of annular indentations and four small nodes indented in the center, placed at equal intervals about the exterior.

From the same mound with the above several other similar vessels were obtained, two of them being larger than the one illustrated. Some fine, large bowls from the same mound have the entire exterior surface decorated with the usual compound filfot stamp. One of these is presented in the lower figure, plate CXV *b*.

The handsome vessel illustrated in plate CXVI was uncovered by the plow on Ossabaw island, Chatham county, Georgia. The negroes who discovered it at once reburied it. The manager of the place, learning of this, dug it up again. Within the vase were the bones of a child, with a few beads and ornaments. The bones were reinterred by the negroes, who feared that bad luck would follow wanton disturbance of the dead. A bowl, parts only of which were saved, was inverted over the top of the urn, and had prevented the earth from accumulating within. The specimens were acquired by Mr William Harden, of Savannah, who presented them to the Bureau of American Ethnology. This vase corresponds fully in material, shape, and finish with others from various parts of the Appalachian region. The stamped pattern

[a] Hariot, Thomas, A brief and true report of the new found land of Virginia, Frankfort, 1590, pl. XV.



a (HEIGHT 16 INCHES)



b (DIAMETER 16¼ INCHES)

TYPICAL SPECIMENS OF STAMP-DECORATED WARE

SOUTH APPALACHIAN GROUP



LARGE VASE DECORATED WITH FILFOT STAMP DESIGN

SOUTH APPALACHIAN GROUP

(HEIGHT 15 INCHES)



b (HEIGHT ABOUT 9 INCHES)



a (HEIGHT 14 INCHES)

VASES DECORATED WITH PADDLE-STAMP IMPRESSIONS

SOUTH APPALACHIAN GROUP

is of the most usual type, but differs from others in having nodes at the center and in having the arms of the cross curved, as shown in plate CXIV *b*. The height is 15 inches, and the diameter at the rim 12 inches. The bowl cover is of the same kind of ware, and is well made and symmetric. The surface inside and out is finished with a polishing tool. The color, as in most of this ware, is a dark brownish gray, somewhat mottled by firing or by use over fire. Four S-shaped ornaments, with nodes placed within the curves, are set about the most expanded part of the body. The diameter is 12½ inches and the depth 7 or 8 inches.

The specimen presented in plate CXVII *a* was plowed up near Milledgeville, Georgia. It was engraved on wood for Dr. Charles Rau, and was published in his Collections of the National Museum, but the defects of drawing are such as to mislead the student with respect to the character of the surface finish. The stamp design was a very simple one, founded on the cross, the four inclosed angles being filled in by straight lines, as is seen in plate CXIV *c*. One arm of the cross was more strongly relieved than the other, and this gave rise, where the impressions happened to be continuous, to the heavy lines shown in exaggerated form in the Rau engraving. That the stamp was rigid and flat on the face is apparent from the nature of the impressions on the convex surface of the vase, and also from numerous deep impressions of the edge of the tool at the sharp curve of the vessel where the neck joins the body. The somewhat fragmentary vase presented in *b* was obtained from a mound in Georgia. The stamp design, so far as it could be deciphered, is given in plate CXIV *d*, and embodies as its main feature the guilloche or the imperfectly connected scroll.

The association of the stamped earthenware with ware typical of surrounding regions may be accounted for in two ways—first, through occupation of a single site by more than one group of people at the same or at different times, and, second, by the possession or manufacture of more than one variety by a single community. Two interesting illustrations of the intermingling of types may be presented. Explorations carried on for the Bureau of American Ethnology under the direction of Dr Thomas in the mounds and graves of Caldwell county, North Carolina, yielded many fine examples of pottery, among which were vases and bowls of southern type, bowls decorated with modeled animal heads and other relieved ornaments in western style, fabric-marked pieces, and rude, undecorated vessels, such as characterize the middle Atlantic tidewater region.

A striking example of the intermingling of separate types was brought to light by the opening of a small mound 10 miles below Augusta, on the Savannah river, Richmond county, Georgia, by Mr H. L. Reynolds, of the Bureau of American Ethnology. No mound has yielded finer examples of the stamped ware, two pieces of which

have already been given (plate CXV), and along with them and intimately associated in the original interments were typical western forms. One piece, a long-necked bottle, with decoration in black paint, would, so far as its general appearance goes, be more at home in western Tennessee, or even beyond the Mississippi. This piece is shown in plate CXVIII *a*. It is neither as well made nor as neatly finished as its western prototypes, and the walls are unusually thick. The clay is tempered with quartz and mica-bearing sand, a strong indication that the vase is actually of Appalachian manufacture. Other bottles of western form, but undecorated, were recovered. One remarkable piece is shown in *b*; it resembles closely the famous "triune vase," *c*, from Cany branch of the Cumberland river, Tennessee, described by Caleb Atwater.[a]

Hardly less remarkable was the occurrence in this richly stocked mound of two cylindric cup-shaped vases, embellished with figures of rattlesnakes, combining in execution, materials, finish, and decoration most of the best features of the wares of the lower Mississippi and the Gulf coast. Unlike the ordinary vessels of the region, these vessels are of the finest clay, which in the interior of the mass is of a light gray color. The surface is blackened and well polished, and the designs, engraved with a fine sharp point, penetrate to the light paste, giving a striking effect. One of these vases appears in plate CXVIII *d*. Encircling its slightly incurved walls are figures of two horned or antlered rattlesnakes and a third serpent only partially worked out. Occupying one of the interspaces between the sinuous bodies of the serpents is a human face resembling a mask, connecting with lines apparently intended to suggest a serpent's body. The smaller cup contains the drawing of a single serpent extending twice around the circumference.

These rattlesnakes are drawn in highly conventional style, but with a directness and ease that could result only from long practice in the engraver's art. They are doubtless of symbolic origin, and the vases were probably consecrated to use in ceremonials in which the rattlesnake was a potent factor. The delineation of the serpent is not specifically different from other examples engraved on stone, clay, and shell found in several parts of the South and West. This remarkable design is illustrated one-third actual size in plate CXIX *a*. The part at the extreme right repeats the corresponding part at the left. The human head or mask is unique among pottery decorations, but it is not distinct in type from the heads stamped in sheet copper found in the mounds of Georgia and those engraved on shell in many parts of the Appalachian and Middle Mississippi regions.

That such a diverse array of ceramic products, inadequately represented by the illustrations given, should have been assembled in an

[a] Atwater, Caleb, Western antiquities, Columbus, 1833, p. 140.



b (HEIGHT 7¼ INCHES)



a (HEIGHT 9 INCHES)



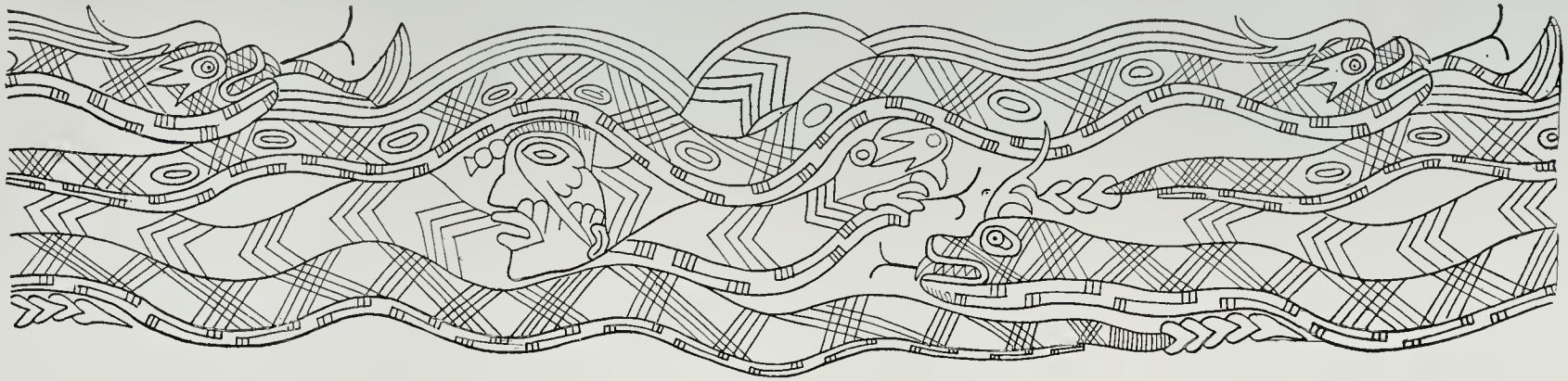
c



d (HEIGHT 5 INCHES)

VASES OF VARIED DESIGN AND EMBELLISHMENT

SOUTH APPALACHIAN GROUP





b



c

ENGRAVED DESIGNS FROM VASES SHOWN IN PLATES CXVIII AND CXX

SOUTH APPALACHIAN GROUP



BOWL WITH ELABORATE ENGRAVED DECORATIONS (MOORE COLLECTION)

SOUTH APPALACHIAN GROUP

(LENGTH 9½ INCHES)



b (DIAMETER 11¼ INCHES)



a (DIAMETER 12¾ INCHES)

LARGE VESSELS FROM EASTERN GEORGIA

SOUTH APPALACHIAN GROUP

(MOORE COLLECTION)

obscure mound on the lower Savannah is indeed remarkable. Excellent examples of the pottery of the South, the Southwest, and the West are thus found within 100 miles of the Atlantic seaboard. Not the least interesting feature of this find was the occurrence of part of an old-fashioned English iron drawing knife and some wrought-iron nails, associated, according to the report of Mr Reynolds, with the various articles of clay, stone, and copper in the mound, thus apparently showing that the mound was built and that all the varieties of ware were made or assembled by a single community in post-Columbian times.

Mr Reynolds was firm in his belief that these vases and the diverse articles referred to were associated in the original interments in the mound, yet many will feel like questioning this conclusion. If a mistake was made by the explorer with respect to this point, the interest in the series is hardly lessened. If he is right, the mound was built by a post-Columbian community composed of distinct groups of people still practicing to some extent their appropriate arts, or by members of a single group which, by association, capture, or otherwise, had brought together artisans from distinct nations, or had from various available sources secured the heterogeneous group of objects of art assembled. If he is wrong, we are free to assume that the original stock which practiced the ordinary arts of the Appalachian province had built the mound and deposited examples of their work: that, at a later period, they had acquired and used exotic artifacts in burial in the same mound, or, that the mound was, after the coming of the whites, adopted by a distinct people who there buried their dead, together with articles of their own and of European manufacture. In such a case it would be reasonable to suppose that the earlier people were of Muskhogean or Uchean stock, and that the latter were the Savannahs or Shawnees. The report of Mr Reynolds on the opening of this remarkable mound is embodied in the work of Dr Thomas in the Twelfth Annual Report of the Bureau of Ethnology. A number of clay pipes obtained from this mound are shown in plate CXXIV. They are of forms prevalent in the general region.

The extension of typical Appalachian wares eastward toward the coast of North and South Carolina and Georgia is made manifest by recent researches of Mr Clarence B. Moore. From a mound in McIntosh county, Georgia, Mr Moore obtained the remarkable bowl shown in plate CXX, and a second specimen nearly duplicating it. It is quite eccentric in shape, as is well shown by contrasting the end view, *a*, with the side views, *b* and *c*. The color is quite dark, and the surface well polished. It is embellished with engraved figures in lines, and excavated spaces covering nearly the entire surface. The scroll border above is somewhat irregularly placed, and encircles, at opposite sides, a little node, the only modeled feature of the vase. The design, drawn at full length, is shown in plate CXIX *b*, and is apparently a

rather crude attempt to depict a bird-serpent monster, some of the elements undoubtedly referring to the eye, wings, and feathers of the bird, while certain other features suggest the serpent; as a decoration it is very effective. It undoubtedly represents an important mythologic concept. The design from the companion vessel is shown also on this plate (*c*), and is a more simplified presentation of the same subject.

The large jar illustrated in plate CXXI*a* is unique in the shape of the neck, which is depressed, sinking partly within the shoulder. The form is graceful and effective, however, and the decoration is the typical button-centered filfot, applied with a paddle-stamp.

It appears also that vessels of the Gulf Coast type—at least with respect to the ornamentation—occur on the Atlantic coast, and one is shown in plate CXXI*b*. This is a tub-like specimen, 15 or 16 inches in diameter, with broken incised scroll work encircling the upper half of the body, which expands toward the base in a way seldom noticed in ware of its class.

In the collections recently made by Dr Roland Steiner in northwestern Georgia, we find another novelty in the shape of some terra-cotta figures. Some of these appear to have been derived from the margins of bowls or other vessels, while others are figurines pure and simple. The faces in some cases are modeled with exceptional skill, but the most notable feature is the flattening of the head, which gives to the specimens a striking resemblance to the flat-headed terra-cotta figures of Mexico. These objects are shown in plates CXXII and CXXIII. The associated vessels are all of South Appalachian type.

TOBACCO PIPES

It is difficult to say what forms the tobacco pipes of the southern Indians had taken in pre-Columbian times, the early writers having said little with reference to them. Their great number, the high degree of elaboration, and the wide differentiation of form indicate, however, a long period of tobacco pipe making. Stone was evidently the favorite material, and steatite, especially, being easily carved, handsome in appearance, and not affected by fire, took a prominent place. The historic tribes of the region, and especially of the Carolinas, have always been great pipe makers and have for at least a hundred years[a] practiced the art with much ardor, using the product in trade with neighboring tribes and with the whites. This commercial work has led to no end of fanciful elaboration of form, and to much that is strained and bad. We are led by this circumstance to question the age of all the more ornate forms of pipes not found in associations that prove them to be ancient.

The prevailing Algonquian clay pipe was a simple bent tube, and the Iroquois elaborated the same general form by various modifica-

[a] Lawson, John, History of Carolina, Raleigh, 1860, pp. 56, 338.



FIGURINES FROM NORTHWESTERN GEORGIA

SOUTH APPALACHIAN GROUP

(ACTUAL SIZE)

HELIOTYPE CO., BOSTON.

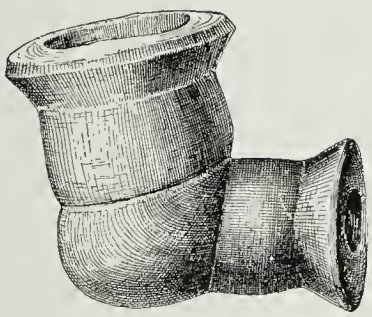


FIGURINES FROM NORTHWESTERN GEORGIA

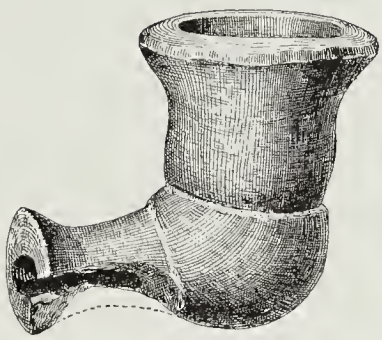
SOUTH APPALACHIAN GROUP

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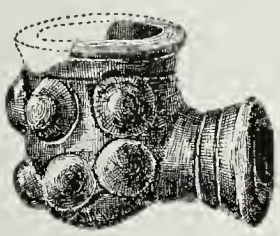
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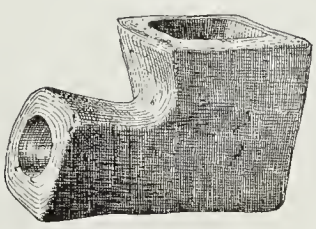
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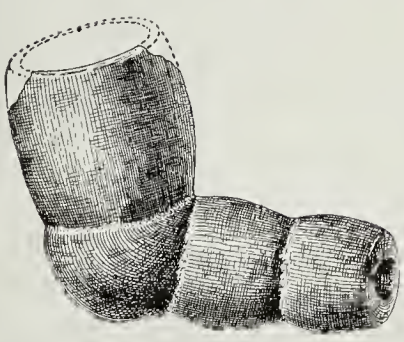
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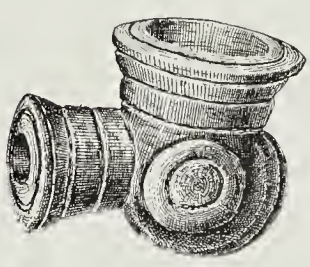
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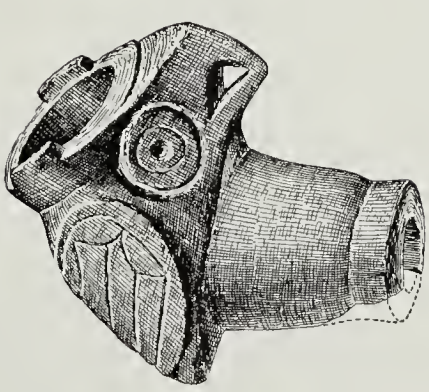
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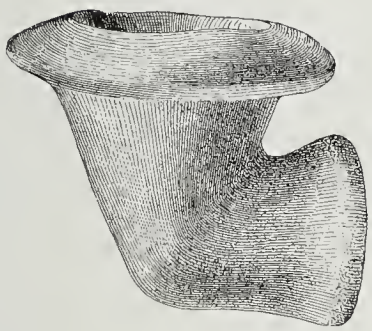
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TOBACCO PIPES FROM BURIAL MOUNDS

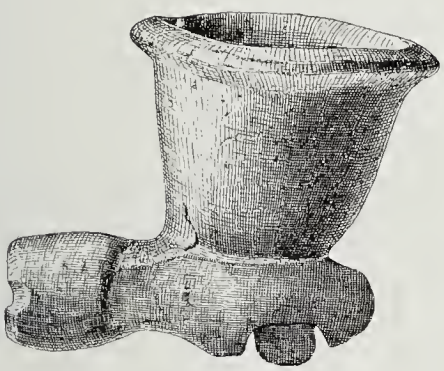
SOUTH APPALACHIAN GROUP



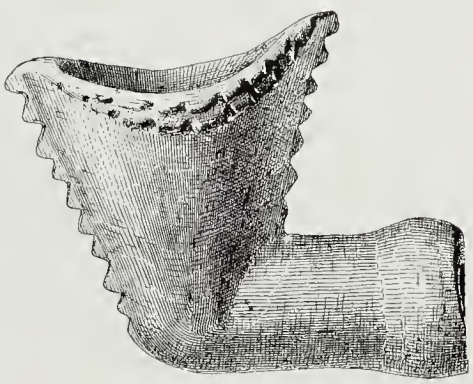
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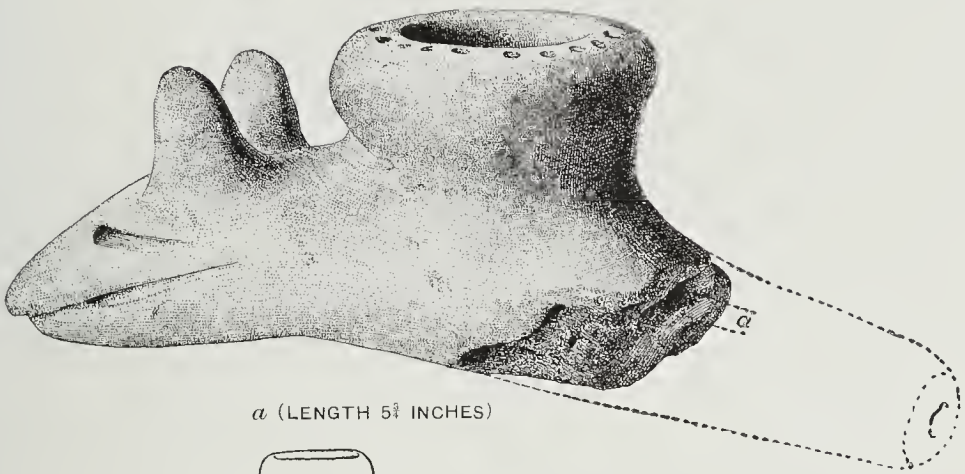
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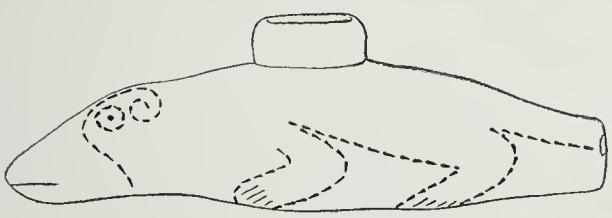
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TOBACCO PIPES FROM BURIAL MOUNDS

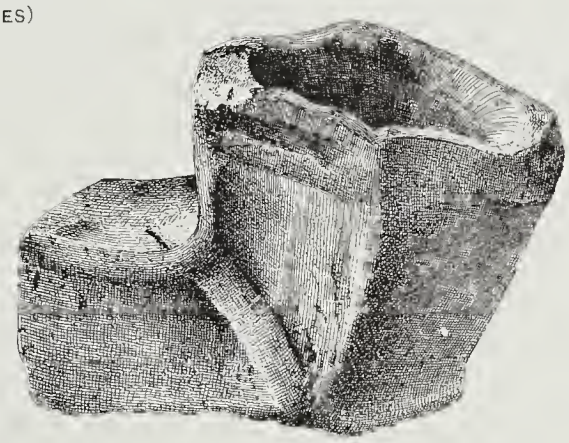
SOUTH APPALACHIAN GROUP



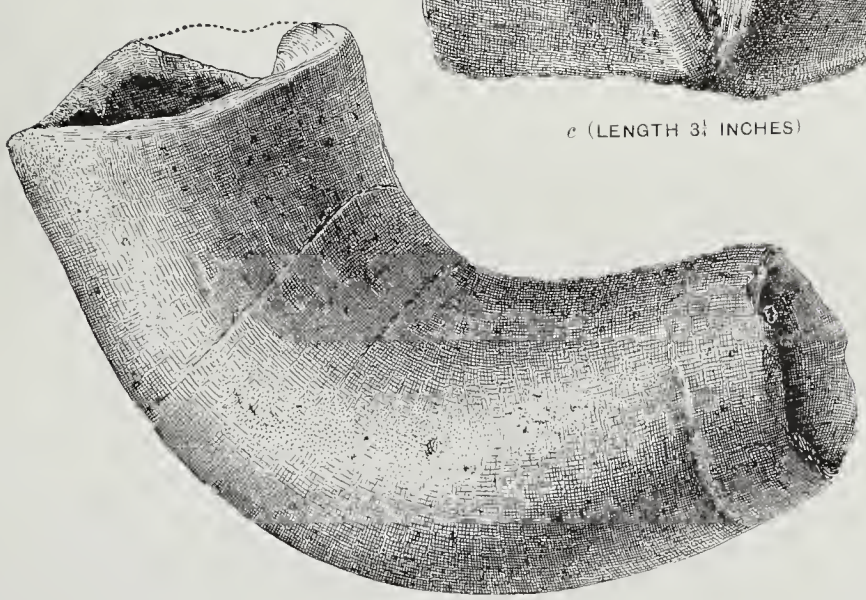
a (LENGTH 5¾ INCHES)



b (LENGTH 5½ INCHES)



c (LENGTH 3¼ INCHES)



d (LENGTH 5¼ INCHES)

TOBACCO PIPES FROM BURIAL MOUNDS

SOUTH APPALACHIAN GROUP

tions and additions. The same radical form is discovered in the clay pipes of the Appalachian country. As has been observed elsewhere in this paper, the groups or varieties of pipes are not so well marked as are the groups of vessels. Pipes are subject to free transportation, and no matter how distinctive the work of a given people, the presence of so many stocks moving back and forth must necessarily have led to much confusion.

Nothing more will here be attempted than the presentation of plates in which are brought together a number of the more usual clay pipe forms from the general region. The clay used was probably much the same as that employed by the same peoples in vessel making, but was left pure or was tempered with finely comminuted ingredients. The surfaces were usually well polished or were covered with various relieved ornaments. The colors were those of the baked clay. As a rule the fundamental shape was the bent trumpet; often, however, it was much modified, and was sometimes loaded with animal and conventional features in relief or in the round, as is shown in plates CXXIV and CXXV. Effigy pipes in clay are not common, but good examples are seen in our museums, and several are presented in plate CXXVI.

The heavy pipe with stem and bowl of nearly equal weight is a western and southern type found all the way from Florida to Arkansas. Two specimens of this variety were found in a mound on the St Johns river, Florida, by Mr C. B. Moore.

POTTERY DISKS

Pottery disks cut from sherds of ordinary ware are common in the South Appalachian region as well as along the Gulf coast, and it may be



FIG. 60—Small disks cut from sherds.

added that they are found to some extent over nearly the entire pottery-producing region. Some of these objects may have been used in

playing games of skill or chance, but two pairs, found by Mr Moore in graves, indicate the use of the perforated ones as cores for copper ear-disks. A few examples are illustrated in figure 60.

Origin of the Varieties of Ware

It is not yet possible to make a satisfactory analysis of the pottery of the Carolinas. The presence here in pre-Columbian times of numerous stocks of people and the practice of the art by some of the tribes down even to the present day have led to great complexity of phenomena. It happens also that the region has been but little studied, and no one has undertaken the interesting task of tracing the art of the modern tribes—the Cherokees and Catawbas—back through the many changes of the last three hundred years to its pre-Columbian phases. The Cherokees and Tuscaroras are of Iroquoian stock. The former people practice their art to-day in one locality in western North Carolina; the latter, who removed to New York to join the league of the Iroquois early in the eighteenth century, dwelt in central and eastern North Carolina, and probably left ware of somewhat marked peculiarities in this region, as well as in Virginia. The Uchees, and the Yamassees, of Muskhogean stock, dwelt on the Savannah, but probably ceased pottery making at an early date, as they were among the first to come into familiar contact with the colonists. The Shawnees, a tribe of Algonquian stock known in early times as "Savannahs," occupied part of Carolina and Georgia, and must have left numerous traces of their presence. Two tribes of Siouan stock, the Tutelo and Catawba, and perhaps others not so well known, inhabited parts of northern Georgia and western Carolina, and a small area in south-central Virginia, and it is probable that much of the confusion observed in the ceramics of these sections is due to this occupation. The stock was a vigorous one, and must have developed decided characteristics of art, at least in its original habitat, which is thought to be west of the Alleghenies. Through the presence of the various tribes of these five linguistic families, and probably others of prehistoric times, the highly complicated art conditions were brought about. Whether the work of the various tribes was sufficiently individualized to permit of the separation of the remains at the present day is a question yet to be decided, but there is no doubt that the task may be at least partially accomplished by systematic collection and study.

The first necessary step in this work is a study of the modern and historic work of the tribes that have kept up the practice of the art to the present day. In the introductory pages, under the head Manufacture, the plastic art of the Catawbas and the Cherokees has been described at some length. We naturally seek in the Siouan work in the West analogies with the work of the former tribe, as it was of

Siouan stock. But the Siouan peoples have not been pottery makers in recent times, and we have no means of making comparisons, save on the theory that the Middle Mississippi ware is wholly or partly of Siouan make. Moreover, the modern Catawban pottery has been so modified by post-Columbian conditions that few of the original characteristics are left, and comparison is fruitless. But an examination of numerous ancient sites and a number of mounds in the region occupied by the Catawbas in early historic time, and for an indefinite period in pre-Columbian times, yields forms of vessels distinctly western in some of their features, and in cases there appear also pretty well-defined characteristics of the historic Catawba work. A group of Catawban vessels collected between the years 1876 and 1886 is presented in plate CXXVII*a*. A number of pipes of this people of the same or a later period are shown in plate CXXVIII.

Specimens found on the older dwelling sites of the people resemble the modern pottery in color and finish, but they are of better workmanship, and the shapes resemble less closely those of the whites. All are flat-bottomed, have the thick walls and peculiar color and polish of modern Catawba ware, and are well within the Catawba habitat, even if not from sites inhabited by them in historic times. One specimen labeled "Seminole" is identical with Catawba ware. It is probable that many other examples of old Catawban work exist, but only these few have fallen into my hands. Points of correspondence between this modern ware and the ware of the mounds in ancient Catawban territory, North Carolina, will be pointed out when the latter is presented.

A remnant of the Cherokee tribe now occupies a small reservation in Swain county, western North Carolina. These people were in possession of an immense tract of the South Appalachian region when first encountered by the whites, and there is nothing to indicate that they were not long resident in this region. An examination of their modern art in clay develops the fact that they are skillful potters, and what is of special interest is the fact that their ware has several points of analogy with the ancient stamped pottery of the South Appalachian province. Their ware retains more of the archaic elements of form than does that of the Catawbas, and the stamps they use in decoration are identical in many respects with those formerly used in the entire region extending from southern Florida to Virginia.

The question may thus be raised as to whether the Cherokees, rather than the Uchees or the Muskhogean tribes, are not the people represented by the ceramic remains of the Southeast. Such speculations are, however, in the present state of our knowledge, quite vain, and they may be misleading. All we can surely know is that these people retain well-defined features of the ancient art of the region, and that much of the ancient stamped ware of northern Georgia, western

Carolina, and eastern Tennessee is probably theirs, for it is found on the sites known to have been long occupied by them.

Specimens of modern Cherokee work are shown in plate CXXVII*b*. Processes of manufacture have been sufficiently dwelt on in the introductory pages.

In plate CXXIX a number of vases from mounds in Caldwell county, North Carolina, are brought together. They display great diversity of characters—eastern, southern, and western—and, at the same time, bear evidence of recentness, and, in cases, of relationship to modern ware. All are tempered with silicious ingredients, and all seem, from the manner of their occurrence, to have belonged to a single community. Two specimens, the right and left in the lower row, are typically western in appearance. In the upper middle vase we see the handles and the side ornament in relief characters rare on the eastern slope but common in Tennessee; the stamped piece on its right affiliates with the southern ware, and the upper left-hand vase is a southern shape having incised designs like those of the Gulf coast. The remaining cup shown illustrates the use of fabrics in the construction and embellishment of pottery. The entire surface is deeply marked with a textile mesh, which at first sight suggests that of the interior of a rude basket, but close examination shows that it is the impression of a pliable fabric of open mesh woven in the twined style. It is seen that there is much lack of continuity in the imprinting, and also that the markings must be the result of wrapping the plastic vessel in fabrics to sustain it, or of the separate applications of a bit of the texture held in the hand or wound about a modeling paddle. This piece is more at home on the Atlantic coast of North Carolina and Virginia than it is in the South or West. From the Jones mound, in the same section, we have a series of vessels of still more modern look. So far as shape and finish go they are decidedly like the modern Catawba ware.

Over all this Carolina region there are indications of southern as well as western and northern influence, and vessels and sherds are obtained in many places that affiliate with the art of the South. The stamped varieties are intermingled with the other forms in the shell heaps of the Atlantic, on river sites back to the mountains, and, in places, even across to the heads of western-flowing streams.

There are also specimens of the peculiar florid scroll work of the Gulf province, and we may infer that southern tribes made their influence felt as far north as Virginia, beyond which, however, a scroll design, or even a curved line, is practically unknown, and the southern peculiarities of shape are also absent.

As we pass to the east and north in North Carolina it is found that the southern and western styles of ware gradually give way to the archaic forms and textile decorations of the great Algonquian area. From a



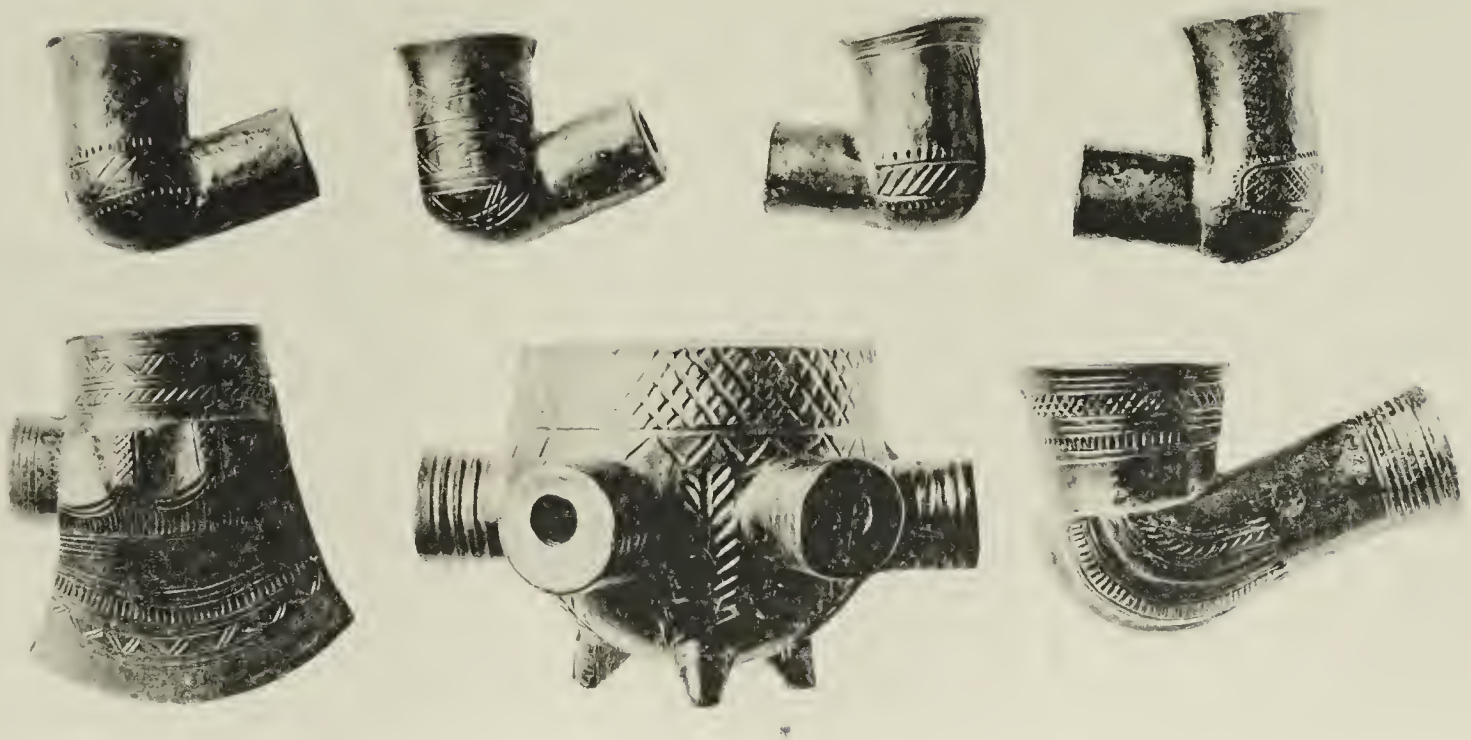
a (DIAMETER OF LARGE BOWL 10½ INCHES)



b (DIAMETER OF LARGE POT 10 INCHES)

MODERN POTTERY OF THE CATAWBA AND CHEROKEE INDIANS

SOUTH APPALACHIAN GROUP



MODERN TOBACCO PIPES OF THE CATAWBA INDIANS

SOUTH APPALACHIAN GROUP

(TWO-THIRDS)

HELIOTYPE CO., BOSTON.



POTTERY FROM BURIAL MOUNDS IN NORTH CAROLINA

SOUTH APPALACHIAN GROUP

(ONE-THIRD)

HELIOTYPE CO., BOSTON.

kitchen midden on the Yadkin, in Wilkes county, within less than 25 miles of the Virginia line, we have a few specimens of very rude stamped ware and many pieces of large, coarse vessels that duplicate the shell-heap ware of the Chesapeake. This is about the northern limit of southern forms, but northern forms extend, with gradually decreasing frequency, to the western and southern borders of the state.

POTTERY OF THE MIDDLE ATLANTIC PROVINCE

Review of the Algonquian Areas

As was pointed out in the introductory pages, a broad and important distinction is to be drawn between the ceramic products of the two great regions which may be designated, in a general way, as the North and the South. The former comprises that part of the great Algonquian-Iroquoian territory of historic times which lies to the north of a somewhat indefinite line extending from below Cape Hatteras, on the Atlantic coast, through southwestern Virginia, eastern Kentucky, middle Ohio, northern Indiana, northern Illinois, and middle Iowa to Nebraska, and beyond; the latter comprehends the territory to the south of this line. The ceramic art of the North is archaic and simple, that of the South is well advanced and complex. South of the line there are compound and varied forms; north of it all forms are simple. The pottery of the South has animal shapes; that of the North has none. The South has vessels with high, narrow necks, and stands and legs; the North has none. The South has painted surfaces and decorations; the North has no color, save the natural hues of the baked clay. The South has the fret, scroll, and other current ornaments, as well as symbolic and delineative designs; the North has little else than simple combinations of straight lines.

There are questions coming up for consideration in this connection, aside from those relating to the grouping and description of the ware, with which this paper is mainly concerned. We seek, for example, the meaning of the somewhat abrupt change of phenomena in passing from the South to the North. Is it due to differences in race? Were the southern tribes as a body more highly endowed than the northern, or did the currents of migration, representing distinct centers of culture, come from opposite quarters to meet along this line? Or does the difference result from the unlike environments of the two sections, the one fertile and salubrious, encouraging progress in art, and the other rigorous and exacting, checking tendencies in that direction? Or does the weakening art impulse indicate increasing distance from the great art centers in the far South, in Mexico and Yucatan? We are constrained also to ask, Is it possible to identify

the people or any of the peoples concerned on either hand, to follow their movements from place to place, to follow them back through the mutations of their history? These questions and others come up for consideration. Answers, or partial answers, to some of them will probably be forthcoming as investigation goes on.

Aside from these general questions, which are always uppermost in the mind of the ethnologist, there are others which pertain to the ceramic art in particular. What do these archaic northern forms teach of the beginnings and progress of art, and what can we learn from them of the inceptive stages of ornament? These queries have been considered to some extent in the introductory pages, and additional suggestions are made in presenting the various groups of ware.

To exactly what extent the Algonquian tribes are responsible for the northern types of pottery, aside from those definitely assignable to the Iroquois, may never be fully determined, but that these types are largely Algonquian may be assumed from the historic occupation of many sections by pottery-making communities of that family. There are complications in the Ohio valley and also, to some extent, in the northern Illinois-Indiana region, where the ceramic phenomena are complex, apparently representing successive occupations of the area by different peoples. It may in time appear that numerous stocks of people were concerned, for, though the ceramic remains indicate in general a primitive condition—a rather uniform grade of progress for the peoples represented—there is marked divergence in the other groups of products; art in stone, bone, and metal had reached a comparatively high degree of advancement in some sections. It may be remarked, however, that had the whole area now assigned to the Algonquian stock been occupied by that stock from the first, to the exclusion of all others, we could not expect uniformity in art remains over so vast an area. Communities of the same blood and culture grade, separated for a long period by great distances, and existing under distinctive environments, would acquire and develop activities and arts only a little less varied than would nonconsanguineous groups under like conditions. It is significant, however, that as we glance over the whole field we observe in the ceramic remains a marked family resemblance, not an equality of grade only, but close analogies in many features of treatment, form, finish, and decoration.

Beginning in the coastal districts of the Carolinas, we pass to Virginia, to New Jersey, to Connecticut, to Massachusetts, and to Maine through a series of groups exhibiting differences in detail, but having decided general likeness. If we pass from the east across the great highland to the Ohio valley, we find that the differences are more marked. There is a general resemblance, with here and there signs of stronger touches and more advanced ideas and practices, but as we pass beyond to the upper Mississippi and the Great lakes, the East is

seen to be repeated in a marked manner, and the merest details must be relied upon to separate sherds from the two distant regions, if, by accident, they become intermingled.

The Iroquoian group will be treated in a separate section, while the northern and eastern Algonquian territory may be reviewed as carefully as the meager collections and incomplete observations at hand will permit.

In the rather imperfect light of present knowledge, we may to best advantage consider the ceramic work of this great province under heads which express something of geographic culture grouping. First, we have the Middle Atlantic province, which, for comparative study of details, may be further separated into several subdivisions, the principal being the Chesapeake-Potomac region, which presents a well-defined unit, geographically, culturally, and ethnically.[a] Second, there are the entire New Jersey and New England areas. The first of these appears to be divided somewhat between the Delaware valley and the coastal districts, while in the second collected data are so meager that little can be done in the way of systematic technic or comparative study. These Atlantic provinces are indicated approximately on the accompanying map, plate IV. Third is the Ohio Valley province, in which we shall have two or three subdivisions of fictile remains which are not distinct geographic groups, one of them, at least, extending far to the west in a succession of areas. Fourth, we have the Upper Mississippi and Missouri Valley provinces, so far little studied; and fifth, the region of the Great lakes, of which we have only fragmentary bits of information.

Pamlico-Albemarle Ware[a]

South Appalachian forms of ware prevail throughout Georgia and South Carolina, save along the coast, where the simple textile-marked wares of the North extend far southward, gradually diminishing in frequency of occurrence. Southern forms prevail largely in North Carolina, giving way farther north and in the region of the great sounds and their tide-water tributaries to other forms apparently showing Algonquian handiwork or influence. The change from southern to northern types is rather gradual, which may have resulted from contact of peoples living contemporaneously in neighboring districts. In some cases all varieties are found together, as in the Lenoir mounds in Caldwell county, North Carolina, the village sites of the Yadkin, and elsewhere. The intermingling does not consist exclusively in the assemblage of specimens of separate groups of ware, as if people from different sections had successively occupied the sites, but features typical of these sections are combined in the same group of vessels, or even in the same vessel.

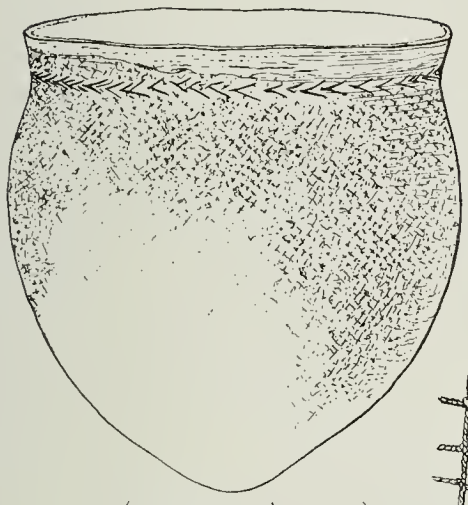
[a] In the illustrations all the pottery of the Middle Atlantic province has been classed as of the Chesapeake-Potomac group.

The northernmost advance of strictly South Appalachian features of the art so far observed is in the valley of the Yadkin in North Carolina, near the Virginia line; and the farthest advance of southwestern features is in the upper valleys of the Shenandoah and James, on the historic highway of the tribes between the North and South.

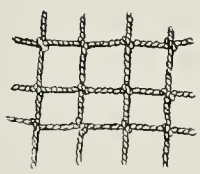
Particular attention may be called to the contents of village sites on the Yadkin in Wilkes county, North Carolina, just referred to. Here we have rather rude ware, mostly large, fire-blackened culinary utensils, manifestly of comparatively recent date. Among the sherds are a few pieces bearing stamped designs of southern type. We also have examples of the large, conic, net-marked vessels so prevalent in the Potomac-Chesapeake country. A wide zone of sites extending across the middle section of the state on the line of the Yadkin, and probably down to the sea in South Carolina, exhibits a remarkable intermingling of northern and southern elements.

In form the Wilkes county midden ware is limited almost exclusively to the wide mouthed caldron, with rather long body and somewhat conic base. The vessels are rudely treated, unsymmetric in shape, and thick-walled. The paste is tempered with a large percentage of gritty sand or coarsely pulverized steatite, the fragments of the latter standing out in high relief on weathered surfaces. The steatite in many cases forms one-half or two-thirds of the mass. In plate CXXX a series of outlines is given, restored from the many large fragments, which will convey a fair idea of the character of the vessels.

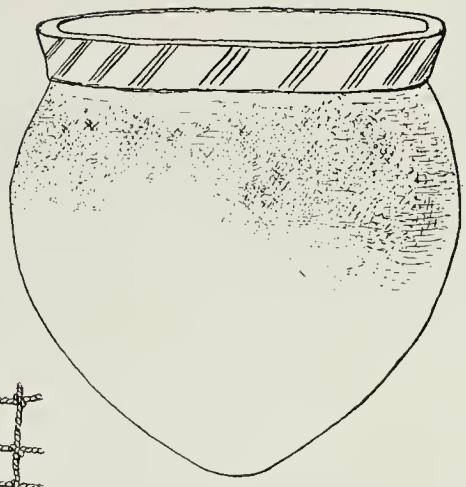
This ware exhibits great diversity of surface treatment. Aside from the few stamped pieces (which may be the work of a separate people, although akin to the prevailing type in everything save the surface finish), the vessels are nearly all marked with netting of about the weight of our finest fish netting (plate CXXX *b*). A superficial examination gives the impression that the vessels have been modeled or handled when plastic in a net, or that a net has been applied to the entire surface by wrapping, but a study of the markings shows that generally the texture has been applied with the aid of a net-covered paddle with which the plastic surface was beaten. In plate CXXXI *a* is photographically reproduced a fragment in which five facet-like surfaces, the result of that number of applications of the net-covered implement, are imperfectly shown. Certain heavier knottings are repeated in each impression, demonstrating the fact that the fabric was fixed to the tool and not applied to the vessel as a mold or wrapping. Had the latter been the case, the mesh impression would have been somewhat completely connected and continuous. In numerous cases parts of the surfaces have been scarified with a serrate-edged tool or comb, obliterating the net marks, as if in preparation for polishing and decorating. In a few cases very rude incised figures have been added, as is seen in the examples given in plates CXXXI *a* and CXXXII *a*.



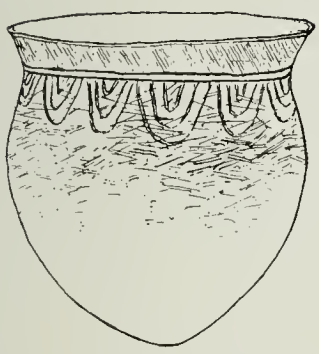
a (DIAMETER 13½ INCHES)



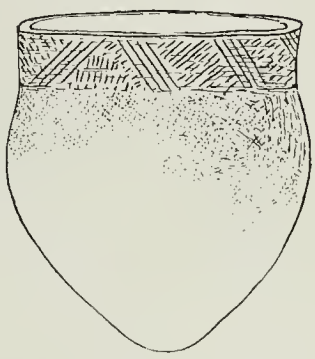
h



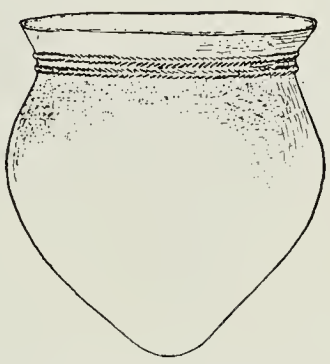
b (DIAMETER 12 INCHES)



c (DIAMETER 6 INCHES)



d (DIAMETER 9 INCHES)



e (DIAMETER 10 INCHES)



f



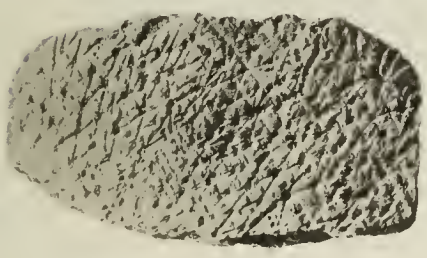
g (DIAMETER 11 INCHES)

KITCHEN MIDDEN POTTERY WITH VARIED MARKINGS

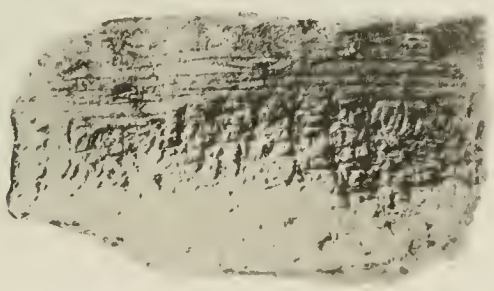
CHESAPEAKE-POTOMAC GROUP



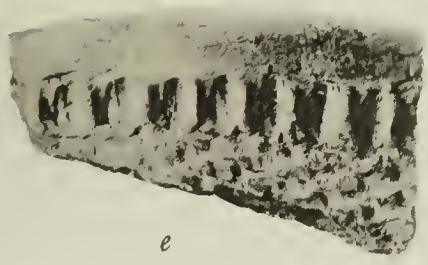
a



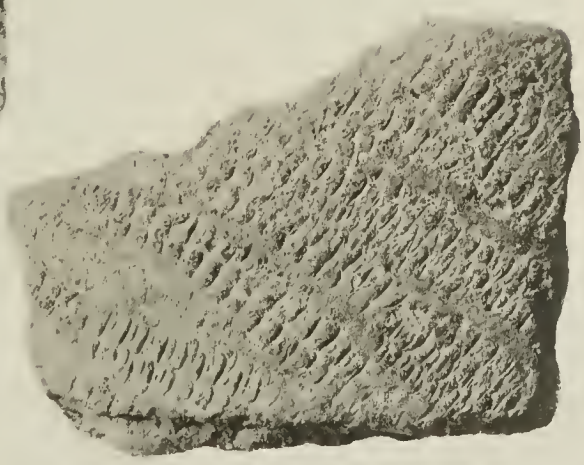
b



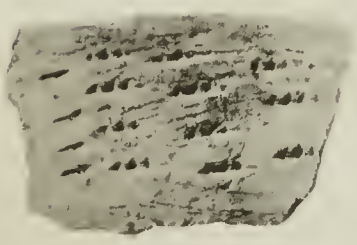
c



e



d

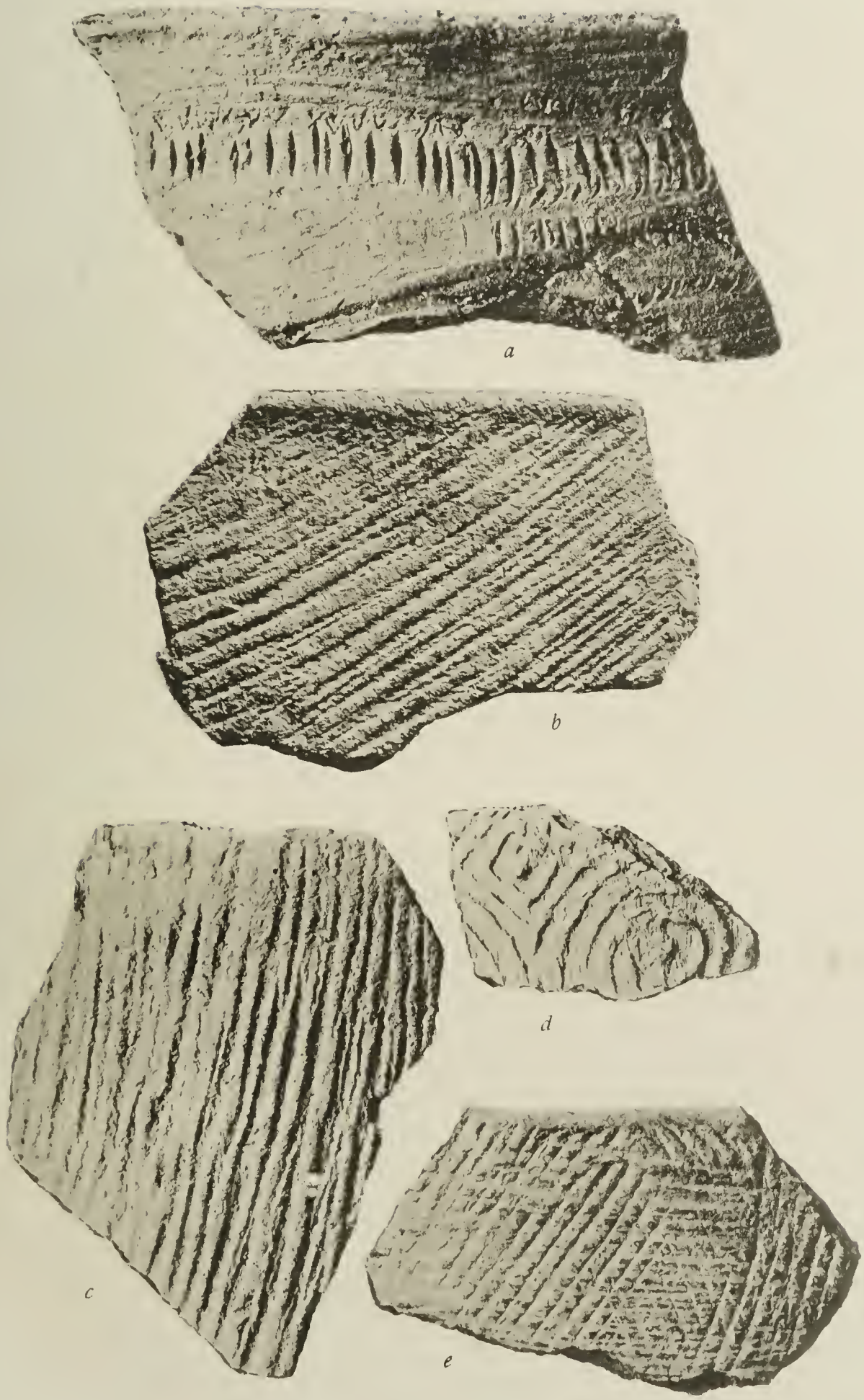


f

KITCHEN MIDDEN POTTERY OF THE YADKIN VALLEY

CHESAPEAKE-POTOMAC GROUP

(ONE-HALF)



KITCHEN MIDDEN POTTERY OF THE YADKIN VALLEY

CHESAPEAKE-POTOMAC GROUP

(THREE-FOURTHS)

The rim was smoothed down with the fingers, and the interior surface was finished with the scarifying tool, roughly applied. In a few cases rude ornamental effects have been produced by using the finger nail as a roulette, giving much the effect of fine net impressions. The nail was rolled back and forth as the finger was moved with rather strong pressure around the neck of the vessel. A specimen of this unique treatment is shown in plate CXXXI *d*, and some simpler finger-nail work is seen in plate CXXXII *a*. The use of a notched indenting tool is indicated in plate CXXXI *f*. Narrow fillets of clay were in cases rudely laid on and decorated with the nail in herringbone effects.

The surface treatment of a number of specimens is identical with that of the net-marked vase from Caldwell county, shown in the preceding section, plate CXXIX. It appears evident that in finishing the rim of the vase a fillet of netting was wrapped about the neck to cause the desired constriction and hold the vessel together while the margin was pressed outward and finished.

The sherds shown in plate CXXXII *b* and *c*, the former from Wilson, North Carolina, and the latter from Clarksville, Virginia, illustrate the use of the cord roulette or cord-wrapped stamp in texturing and malleating the surface of vessels. The effect of rolling the tool back and forth is readily seen. The small fragment given in *d* shows the use of a wooden stamp with a neat design in curved lines in South Appalachian style. The clay retains the impressions of the grain of the wood. In *e* the surface has been textured with a wooden stamp or paddle the face of which was grooved, the effect being very like that of stamping with cord-covered tools.

PIEDMONT VIRGINIA WARE[a]

In northwestern North Carolina and in southwestern Virginia a somewhat marked local variety of pottery is developed which partakes to some extent of the character of the ware of the far Northwest, and probably represents some of the tribes which occupied the Virginia highland about the period of English colonization. Indeed, traces of this variety occur on the James in its middle course, and appear on the Dan, the Yadkin, and possibly on the upper Shenandoah. It occurs plentifully on New river, and will no doubt be found to extend down the westward-flowing streams, thus connecting with the little-known groups of northeastern Tennessee, eastern Kentucky, and western West Virginia. The pottery is always rude, and consists of simple pots, nearly always showing the soot-blackened surfaces of culinary utensils. Their strongest characteristics are the very general presence of rudely modeled looped handles, which connect the outcurved rim with the shoulder, bridging a short, slightly constricted neck, and the

[a] See footnote on page 147.

frequent occurrence of a thickened collar, sometimes slightly overhanging, after the Iroquoian style, but marked with cords and cord indentings, characteristic of the rim decoration of the Upper Mississippi and Lake Michigan pottery. More extensive collecting may enable us to separate these wares into two or more groups or varieties. Pipes of the simple form common in the eastern Algonquian country are found on some of the sites. A number of sherds illustrating this pottery are brought together in plate CXXXIII. The people concerned may have belonged to the Algonquian stock, for Algonquian features decidedly prevail, but there is a possibility that they were Siouan.

Several sherds from a village-site burying ground 3½ miles north of Luray, Virginia, are presented in plate CXXXIV. The simple but extremely neat pots to which these fragments belong were buried with human bodies in individual graves on the bottom land near a mound, but this mound itself, though containing the remains of many hundred bodies, did not yield any pottery whatever.[a] About Harpers Ferry and Point of Rocks we have the same ware, but at Romney, West Virginia, Iroquoian types prevail.

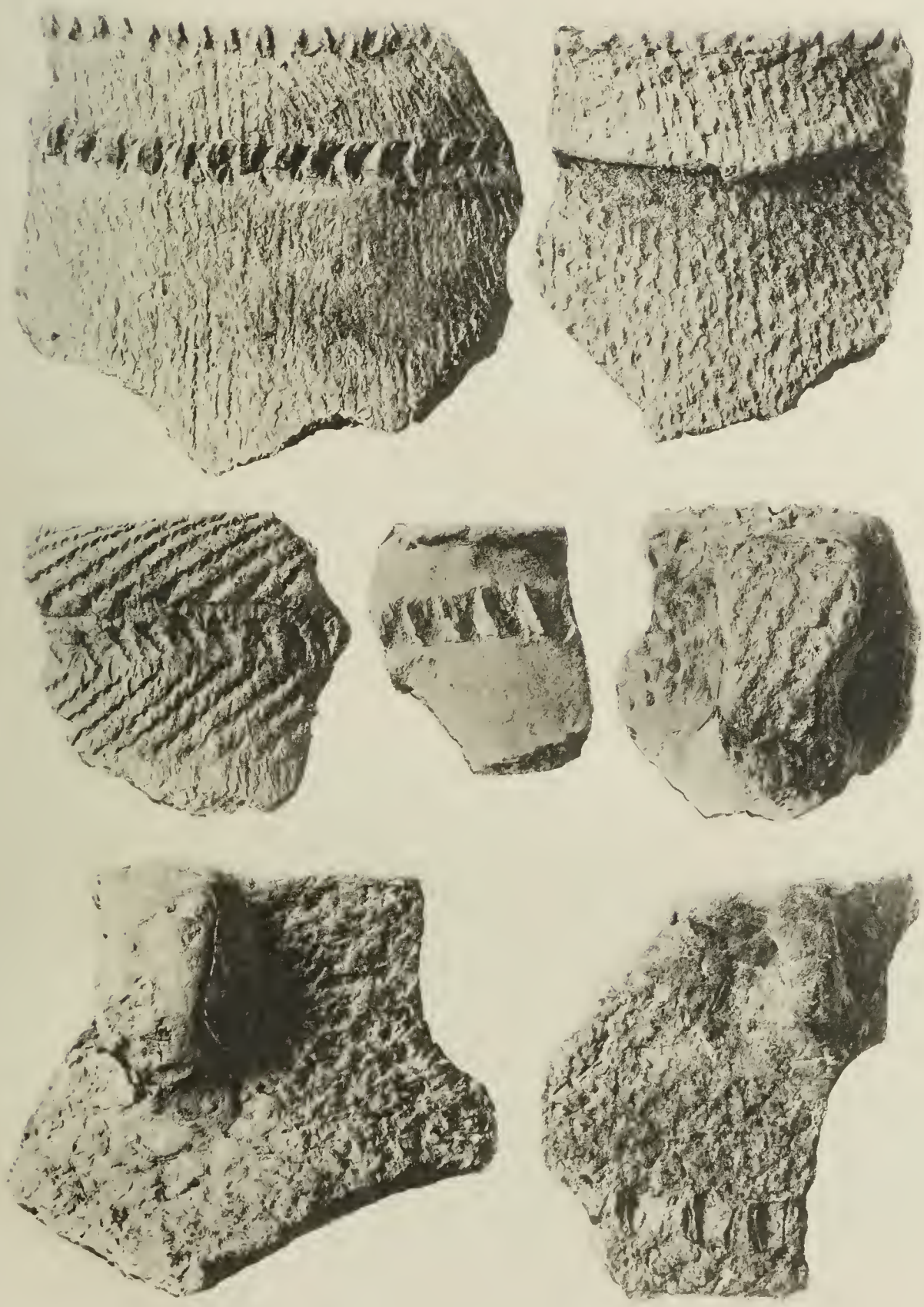
The pottery of upland Virginia and West Virginia is distinguished from that of the tidewater provinces by the prevalence of handles, few examples of which have been found in the latter areas, and the ware of the general Piedmont zone also differs from that of the lowland in the prominence given the neckband—a feature appearing frequently west of the fall line, but rather exceptional east of it.

Potomac-Chesapeake Ware

General features

The central ethnic group of the Potomac-Chesapeake province in historical times was the Powhatan confederacy, seated for the most part between Chesapeake bay and the James river. The art of this district was probably, in the main, developed within the general region, and was practiced in common by the confederacy and other tribes of the same stock along the Carolina coast and throughout the Virginia-Maryland tidewater province. It was probably practiced in more or less modified forms by isolated tribes of other stocks coming within the Algonquian influence. Possibly the conditions of existence along the thousands of miles of tidewater shore line, where the life of the inhabitants was largely maritime and the food was principally marine, may have had a strong influence on the potter's art, tending to make it simple and uniform. The shifting of habitation, due to varying food supply, and possibly to the necessity of avoiding the periodic malarial season, must have restricted the practice of an art which is essentially the offspring of sedentary existence; or the exclusive practice of simple

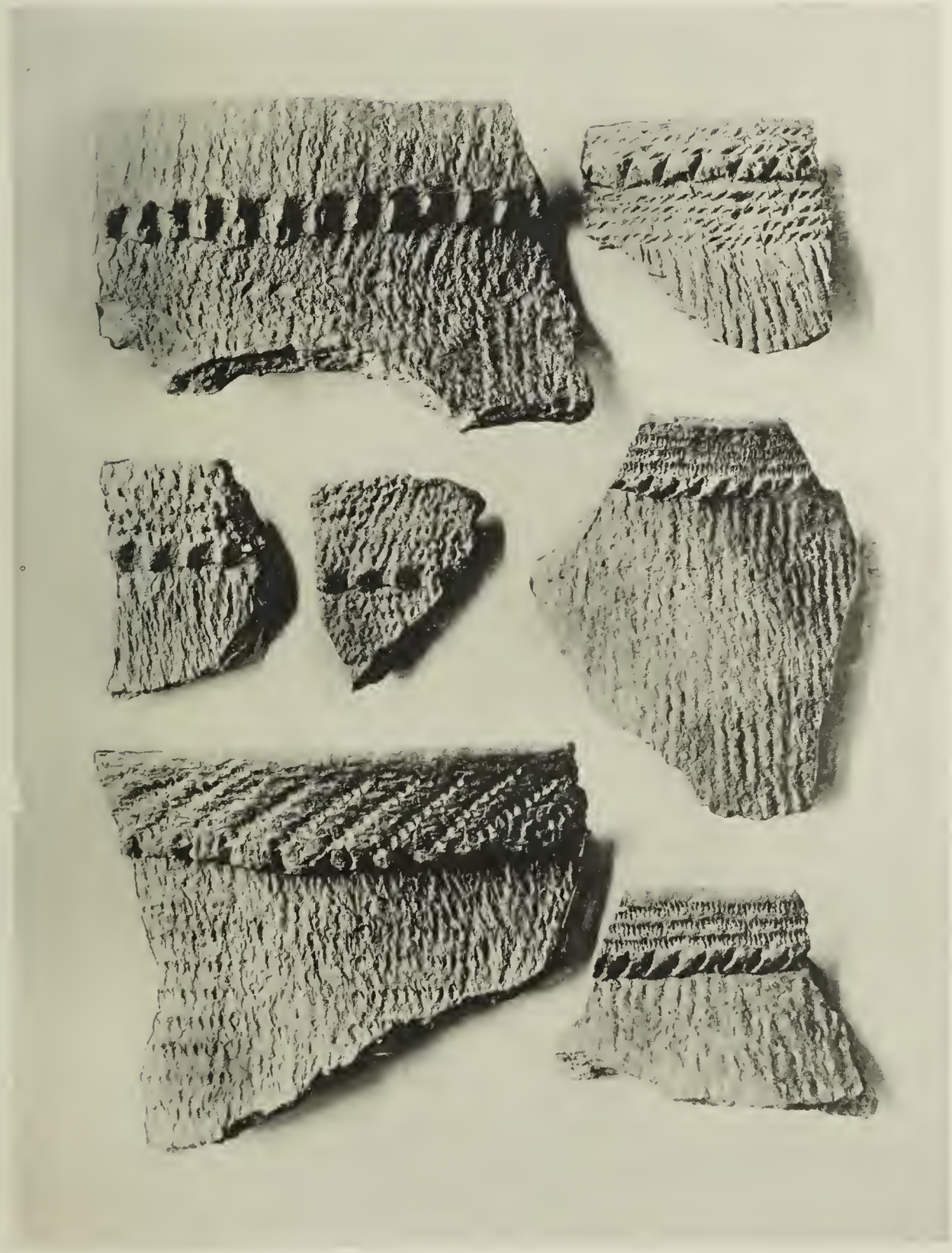
[a] Fowke, Gerard, Archeologic investigations in James and Potomac valleys, Bulletin of the Bureau of Ethnology, 1894, p. 49.



POTSHERDS WITH TEXTILE MARKINGS, NEW RIVER VALLEY, VIRGINIA

CHESAPEAKE-POTOMAC GROUP

(SLIGHTLY REDUCED)

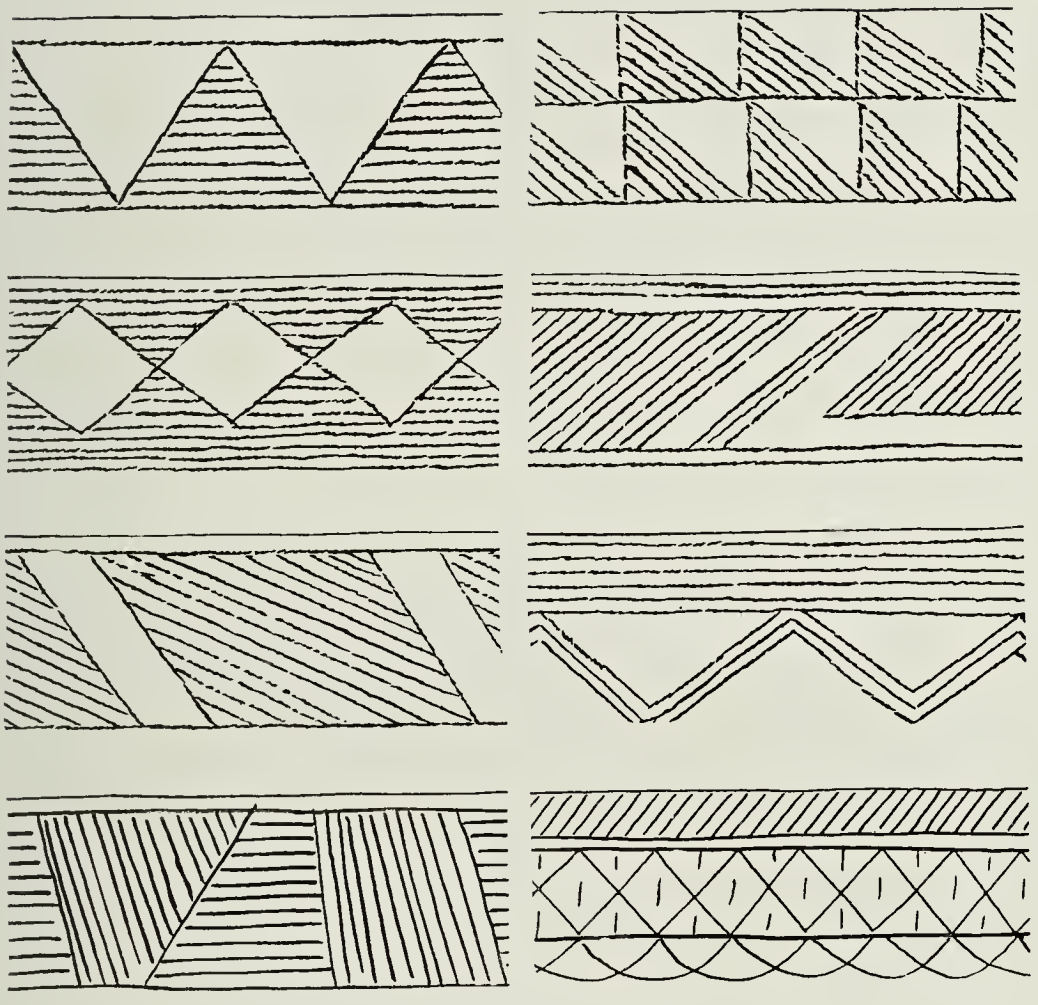


POTSHERDS WITH TEXTILE MARKINGS, FROM LURAY, VIRGINIA

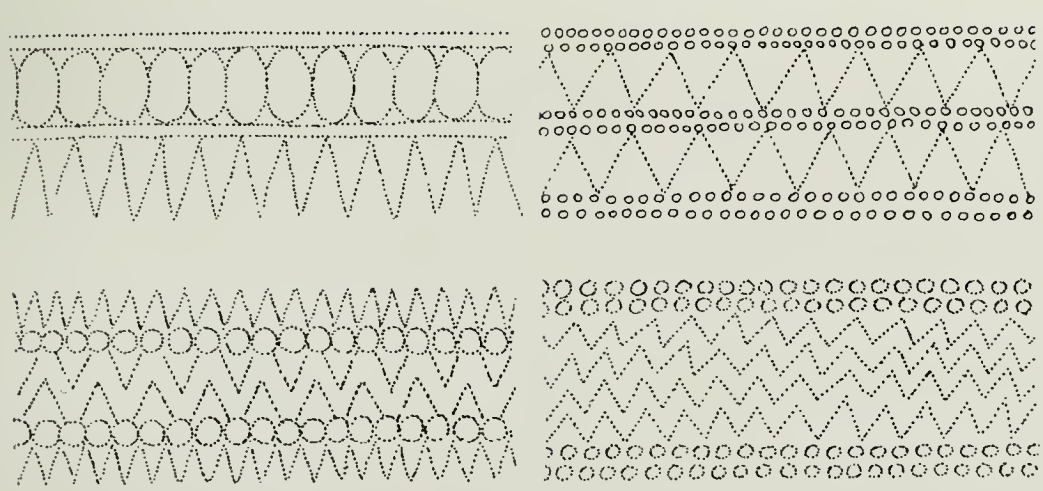
CHESAPEAKE-POTOMAC GROUP

(THREE-FOURTHS)

HELIOTYPE CO., BOSTON.



a



b

INCISED DESIGNS FROM POTTERY, AND TATTOO MARKS

CHESAPEAKE-POTOMAC GROUP

culinary phases of the art may have resulted from the absence of customs demanding vessels for mortuary purposes, ossuary burial at the end of a more or less prolonged period having prevailed to the exclusion of individual inhumation. At any rate, the elementary character and narrow range of the art are its most notable features, and it is remarkable that tribes cultivating maize and practicing several arts with exceptional skill should have been such inferior potters.

Whole vessels are rarely found in the region, and the archeologist must depend for his material on kitchen middens and village sites which furnish fragmentary remains exclusively. There is little trouble, however, in securing enough evidence to reach a correct estimate of the nature and range of the ceramic products. Only pots and kettles and a few simple pipes were produced. The ordinary forms are deep bowls and wide-mouthed pots of medium or small size. Save in remote sections where western and southern tribes are known to have wandered, we do not encounter such features as eccentric or compound forms, animal shapes, constricted mouths, high necks, handles, legs, or flat bases of any kind. Ornament is archaic, and curved lines are almost unknown. These statements are in the main true of the whole Atlantic Algonquian belt from Albemarle sound to the Bay of Fundy.

Though simple in form and archaic in decoration, much of the ware of the great tidewater province was well made and durable. The materials are the clays of the section, tempered with a wide range of ingredients, including pulverized shell, quartz, gneiss, and steatite, besides all grades of ordinary sand. The vessels were largely, if not exclusively, culinary.

Decoration is to a larger extent than elsewhere of textile character, though the Algonquian everywhere employed this class of embellishment. As a rule, the entire body of the vase is covered with imprintings of coarse cloths or nets or cord-wrapped tools, and the ornament proper, confined to the upper portions of the surface, consists in the main of simple geometric arrangements of impressions of hard-twisted cords. Details will be given as the wares of representative localities are described. Besides the textile designs, there are similar figures in incised lines, indentations, and punctures, or of all combined. In plate CXXXV *a* are assembled a number of the figures employed, and with them are placed some tattoo designs (*b*) copied from the work of Hariot,[a] whose illustrations represent the natives among whom the Roanoke colony was planted.

Rims are slightly modified for esthetic effect. Occasionally they are scalloped, and inconspicuous collars were sometimes added. Various indentings of the margin were made with the finger nails, hard cords, or modeling tools.

[a] Hariot, Thomas, A briefe and true report of the new found land of Virginia, Frankfort, 1590.

There is marked uniformity in the ware of thousands of sites scattered over the entire tidewater country, an area nearly 20,000 square miles in extent. The only distinction worth noting is that existing between the commoner variety of village-site ware and a coarser form found nearly everywhere associated with the ordinary variety, but prevailing over it in the great oyster-shell deposits. This latter ware corresponds to the net-marked pottery found so plentifully on the Yadkin in North Carolina, illustrated in preceding plates. In the Chesapeake country this pottery is not exclusively net-marked, other textile materials having been used. Whether or not this ware belonged to a distinct people dwelling at times in the region or whether it is a variety due to differences in function merely can not yet be fully determined, although analogies with the prevailing style are so marked that the theory of separate peoples finds little support.

MODERN PAMUNKEY WARE

Before we pass on to the ware of particular localities it may be mentioned that while the art practiced by the tribes of this province when first visited by the English colonists was soon practically abandoned, at least one community, a remnant of the Pamunkey Indians, residing on their reservation on the Pamunkey river adjoining King William county, Virginia, was practicing a degenerate form of it as late as 1878. At about that time Dr Dalyrimple, of Baltimore, visited these people and made collections of their ware, numerous specimens of which are now preserved in the National Museum. A few of the vases then gathered are shown in plate CXXXVI.

Professor O. T. Mason, referring to the work of Dr Dalyrimple, remarks that these people are "a miserable half-breed remnant of the once powerful Virginia tribes. The most interesting feature of their present condition is the preservation of their ancient modes of making pottery. It will be news to some that the shells are calcined before mixing with the clay, and that at least one-third of the compound is triturated shell."[a]

The modeling of these vessels is rude, though the surfaces are neatly polished. They are very slightly baked, and the light-gray surface is mottled with clouds of black. The paste lacks coherency, and several of the specimens have crumbled and fallen to pieces on the shelves, probably as a result of the slaking of the shell particles. Ornament is confined to slight crimping and notching of the rim margins. None of the pieces bear evidence of use, and it seems probable that in recent years the art has been practiced solely or largely to supply the demands of curiosity hunters. The very marked defects of manufacture and the crudeness of shape suggest the idea that possibly the potters were

[a] Mason, Otis T., Anthropological news, in American Naturalist, Boston, 1877, vol. XI, p. 627.



POTTERY OF THE PAMUNKEY INDIANS, VIRGINIA

CHESAPEAKE-POTOMAC GROUP

(TWO-SEVENTHS)

HELIOTYPE CO., BOSTON.

really unacquainted with aboriginal methods. It will be seen by reference to the illustrations presented in this and the preceding section that this pottery corresponds somewhat closely in general appearance with that of the Cherokees and Catawbas.

In 1891 these Indians were visited by Mr John G. Pollard, from whom the following paragraphs are quoted:

Mr Terrill Bradby, one of the best informed members of the tribe, furnished, in substance, the following account of the processes followed and the materials used in the manufacture of this pottery:

"In former times, the opening of a clay mine was a great feast day with the Pamunkey. The whole tribe, men, women, and children, were present, and each family took home a share of the clay. The first steps in preparing the clay are to dry it, beat it up, pass it through a sieve, and pound it in a mortar. Fresh-water mussels, flesh as well as shell, having been burnt and ground up, are mixed with the clay prepared as above, and the two are then saturated with water and kneaded together. This substance is then shaped with a mussel shell to the form of the article desired, placed in the sun and dried, then scraped with a mussel shell, and rubbed with a stone for the purpose of producing a gloss. The dishes, bowls, jars, etc., as the case may be, are then placed in a circle and tempered with a slow fire; then placed in the kiln and covered with dry pine bark, and burnt until the smoke comes out in a clear volume. This is taken as an indication that the ware has been burnt sufficiently. It is then taken out and is ready for use."[a]

SHELL-HEAP WARE OF POPES CREEK

The heavy, rude, net-marked or coarsely cord-rouletted pottery so common in this province has been found most plentifully at Popes creek on the Potomac, for the reason, no doubt, that the removal of the shells at this place for fertilizing purposes has exposed the pottery more fully than elsewhere. Typically developed, it is a coarse, heavy ware, having a narrow range of form, size, and finish. The paste is highly silicious, and is tempered very generally with quartz sand, some grains or bits of which are very coarse. The color is mostly somewhat ferruginous, especially on the surface, the interior of the mass being grayer and darker. The shapes are simple, and apparently without variations for esthetic effect. The vessels are deep bowls, wide-mouthed pots, or caldrons with conic bases, and are identical in nearly every respect with the midden vessels of Wilkes county, North Carolina, of which sherds are shown in plates CXXXI and CXXXII.

The walls rarely show constriction at the neck, and descend with slight even curves, at angles of from 30 to 50 degrees to the base, as is indicated in plate CXXXVII. The thickness varies from less than one-fourth of an inch to 1 inch, the greatest thickness being at the conic base. The diameter of the largest pieces was 20 inches or more, the depth averaging considerably less than this. The surfaces are

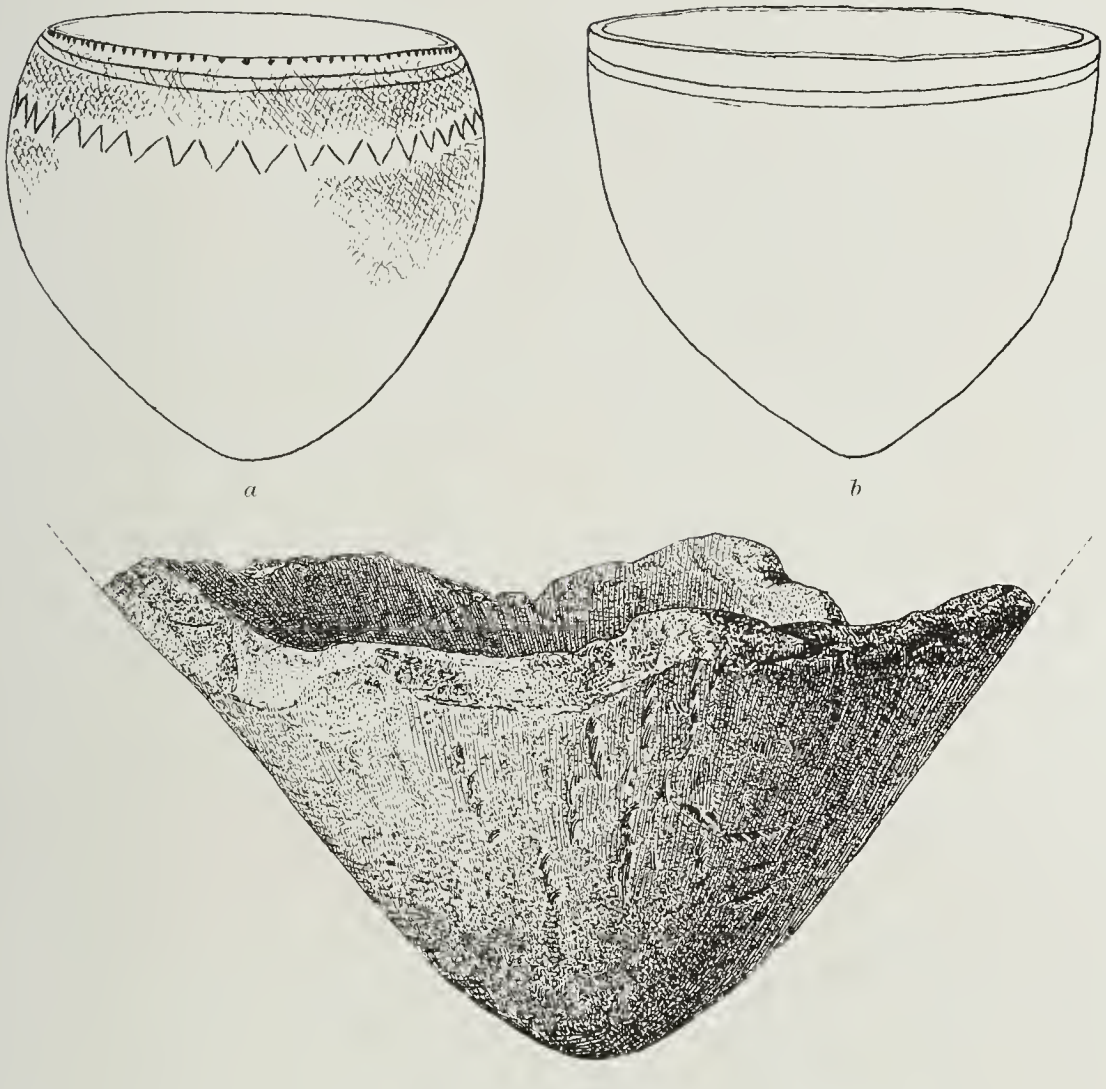
[a] Pollard, John Garland, The Pamunkey Indians of Virginia, Bulletin of the Bureau of Ethnology, Washington, 1894, p. 18.

uneven and roughly finished, but have received a large share of a rude kind of decorative texturing. The exterior surfaee has usually reeeived the imprint of an open-mesh net, applied by repeated paddling (plate CXXXVIII), and the interior has been scarified with a comb, or a serrate-edged tool, the teeth of which, oecurring about ten or twelve to the inch, were blunt and not very even. The original and principal function of this scarifying tool was no doubt that of modeling, but in eases it was drawn baek and forth in such a manner as to produce simple, irregular, patterned effects, illustrated in plate CXXXIX. These eombs were probably notched bits of wood, shell, or bone, not over an inch or two in width. The net-marked exterior and scarified interior are peculiar to this heavy ware, and give it a high degree of individuality.

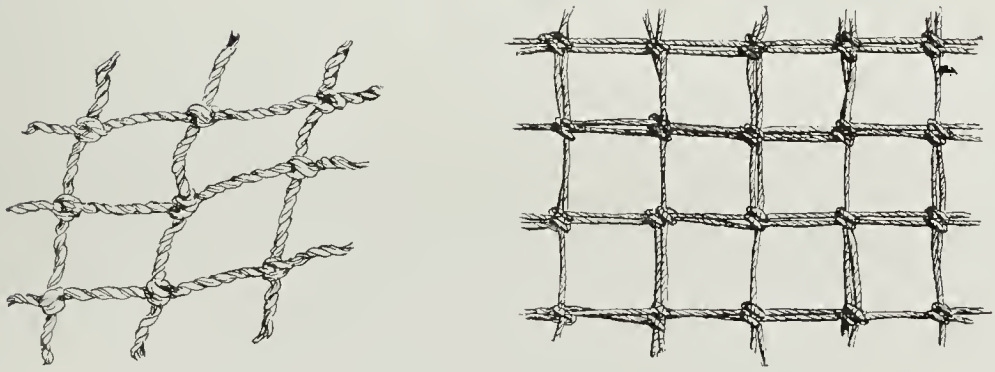
Attempts at systematic decoration are rare. In a few cases, when the rim was turned rather decidedly outward, a band along the inner margin received impressions from a bit of net. The outer margin was rudely rounded or squared off, and, in cases, marked with a net, the finger nail, or an implement. Rude, archaic patterns were sometimes traced with the finger or a blunt tool over the net-marked exterior of the vessel. The net was wrapped about the hand or an improvised paddle and applied to the plastic surface by paddling or rocking. The object of this application was possibly threefold: first, to knit the clay together; second, to roughen the surface to facilitate heating, and, third, to give a pleasing finish. It can not be determined whether the netting used in finishing the surface of these rude vessels was the same as that used in fishing nets, but it may fairly be assumed that it was the same. Rather rarely here, but frequently elsewhere, this same style of ware was finished by applying other varieties of fabrie, or by rolling cord-covered tools over the surface, as is indicated in plate CXXXVIII *b*.

By taking clay impressions from the fictile surfaees, numerous restorations of the netting have been made (plate CXXXVIII *a*). The cords used were well twisted and varied from the size of a small thread to that, even, of coarse wrapping thread or twine. The knotting is generally simple, the meshes ranging from three to seven to the inch. Illustrations are given in plate CXXXVII *d*, *e*, *f*, *g*, *h*. One example, *e*, appears to have the threads arranged in pairs, but this effect, though often reeurring, may be the result of duplieate imprinting. In cases certain strands present the appearanee of having been plaited.

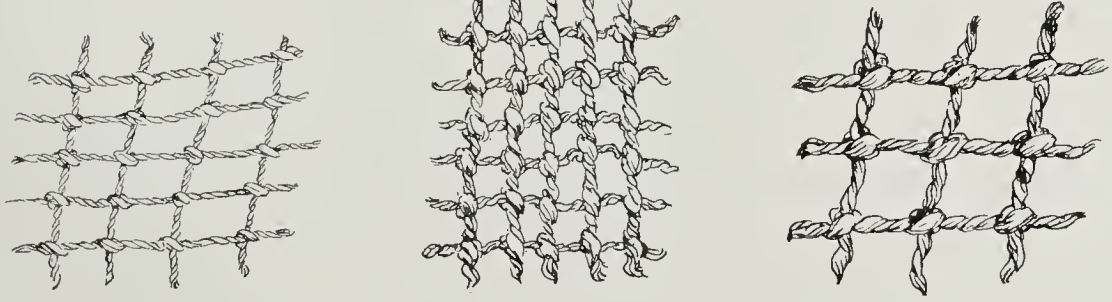
As we have seen, similar pottery oceurs on the Yadkin, in North Carolina; the materials are the same, the shape, size, degree of rudeness, treatment of the surface, and decoration are the same, even the netting and the practiee of partially obliterating the net impressions on the whole or a part of the vessels are the same. This pottery is found in more or less typical forms intermingled with the



a *b* *c*



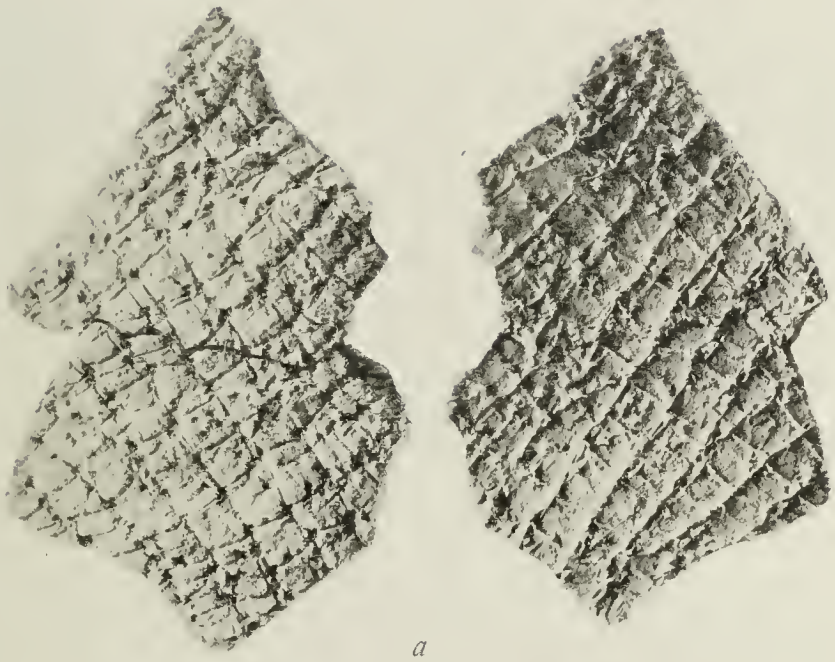
d *e*



f *g* *h*

POTTERY FROM SHELL HEAPS AT POPES CREEK, MARYLAND

CHESAPEAKE-POTOMAC GROUP



a



b

POTTERY FROM SHELL HEAPS AT POPES CREEK, MARYLAND

CHESAPEAKE-POTOMAC GROUP

HELIOTYPE CO., BOSTON.



a (ABOUT TWO-THIRDS)



b



c

POTTERY FROM SHELL HEAPS AT POPES CREEK, MARYLAND

CHESAPEAKE-POTOMAC GROUP

ordinary varieties of ware on sites extending from the Yadkin to the Delaware.

POTOMAC CREEK WARE

The Popes creek shell-heap site, referred to above, is the best representative of its class in the province. It is located just below the upper limit of the oyster banks on the Potomac, which was possibly farther upstream in the period which witnessed the accumulation of the shells on these sites than it is to-day. It will be interesting and instructive to compare the ceramic remains of these deposits with those of a neighboring site on Potomac creek just above the oyster-producing limits, a stretch of nearly 20 miles of the lake-like Potomac intervening. The Potomac creek site, the seat of the famous Algonquian village of Pottowomeck, referred to by Smith, is still well supplied with fragments of the finer varieties of the ware of the region. Few coarse, heavy, carelessly made pieces are found, and net-marked specimens of the Popes creek type are rare, if not absent. It is observed, however, that the coarser wares are fragile, and that they disintegrate readily, as was observed at Popes creek, where the sherds taken from the shell deposits generally crumble on being handled. The two hundred years of cultivation to which the Potomac creek site, unprotected by compact layers of shell, has been subjected, must have gone far toward destroying all save the particularly durable pieces.

The clay used in the Potomac creek ware was usually very fine in texture, the sand employed increasing in coarseness with the size of the vessel. Weathered surfaces show the particles of white sand in relief, while shell is rare or absent. The paste is well baked, and of the usual warm gray colors, rarely approaching terra cotta.

The modeling was often skilful, and the surfaces of many of the smaller vessels were even and well polished. Most of the vessels were quite small, many being mere cups, holding from a pint to a quart. The walls of these vessels were thin and even, and the outlines approximately symmetric. The forms were well within the lines usual in the province, varying from that of a deep cup or bowl to that of a wide-mouthed pot with upright rim and slightly swelling body. The few bases preserved are slightly conic, the point being a little flattened, so that the vessel would stand alone on a hard surface. The finish is considerably varied within certain narrow limits. The prevailing body finish was given by some form of modeling tool covered or wrapped with fine, well-twisted threads, which was rolled back and forth, or was applied as a paddle. In some cases the textile markings were rubbed down for the application of incised or indented designs, and rarely the entire surface was polished.

Decoration was confined mostly to a zone about the rim, and consisted in the main of cord impressions arranged in lines encircling the vessel, or grouped in various ways to form simple patterns. The effect was varied, in cases, by series of indentations made by impressing a sharply folded cord of larger size. Rim-sherds are shown about one-half actual size in plate CXL *b*. The work was all, or nearly all, done by the application of cords singly, the cord having been wrapped about a wheel or some round surface so to be readily rolled back and forth. The rim-margins are simply treated, and are round or squarish, and either plain or indented with an angular tool or a cord. A few small pieces bear marks made apparently by very neat stamps of chevroned lines, possibly some animal or vegetal form. There are other markings too obscure to be made out. It is evident that in cases a finely ribbed paddle was used, almost duplicating the textile effects.

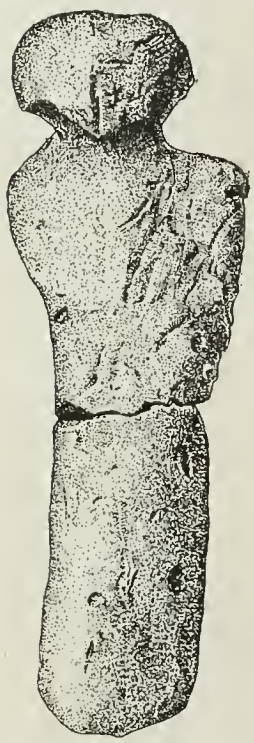


FIG. 61—Rude earthenware figurine, Potomac valley (Phillips collection).

Numerous fragments of the simplest form of tubular clay pipes have been found on this site. The best specimens are in collections made by Mr W. H. Phillips, of Washington, and are illustrated in plate CXLII.

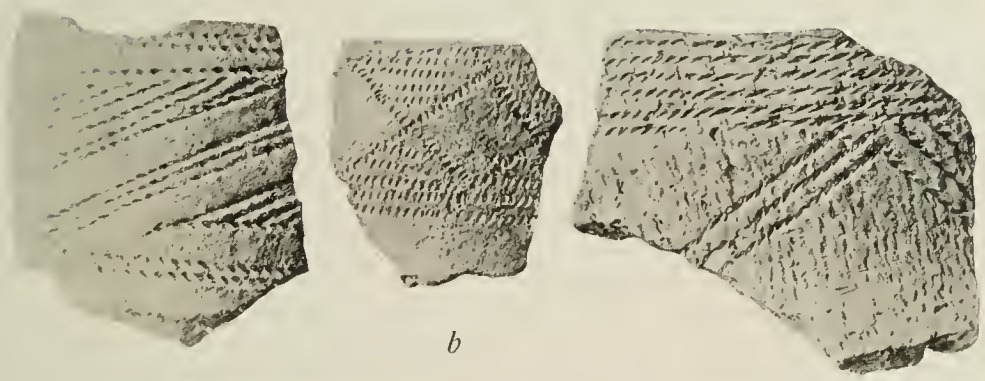
DISTRICT OF COLUMBIA WARE

Generally speaking, the important village sites of the Potomac present a pretty full range of the two types of ware described above as the Popes creek and the Potomac creek varieties, although the latter may be said to predominate and to have the more general distribution. It will be unnecessary to examine other localities in detail, but, on account of local and national interest in the history of the site of the capital city, reference may be made to ceramic remains from the ancient village sites now occupied by the city of Washington. When the English first ascended the Potomac they found a small community of the natives occupying the terraces on the south side of the Anacostia river or Eastern branch, near its junction with the Potomac. Archeologists now find that the occupation was very general in the vicinity, and that relics of stone and clay utensils occur on nearly every available spot along the shores of both rivers, within as well as above and below the city limits.

The ceramic remains of these sites, as turned up by the plow and exposed by erosion and city improvements, are wholly fragmental, but restorations are readily made, and a few illustrations will serve to



a



b



c



d

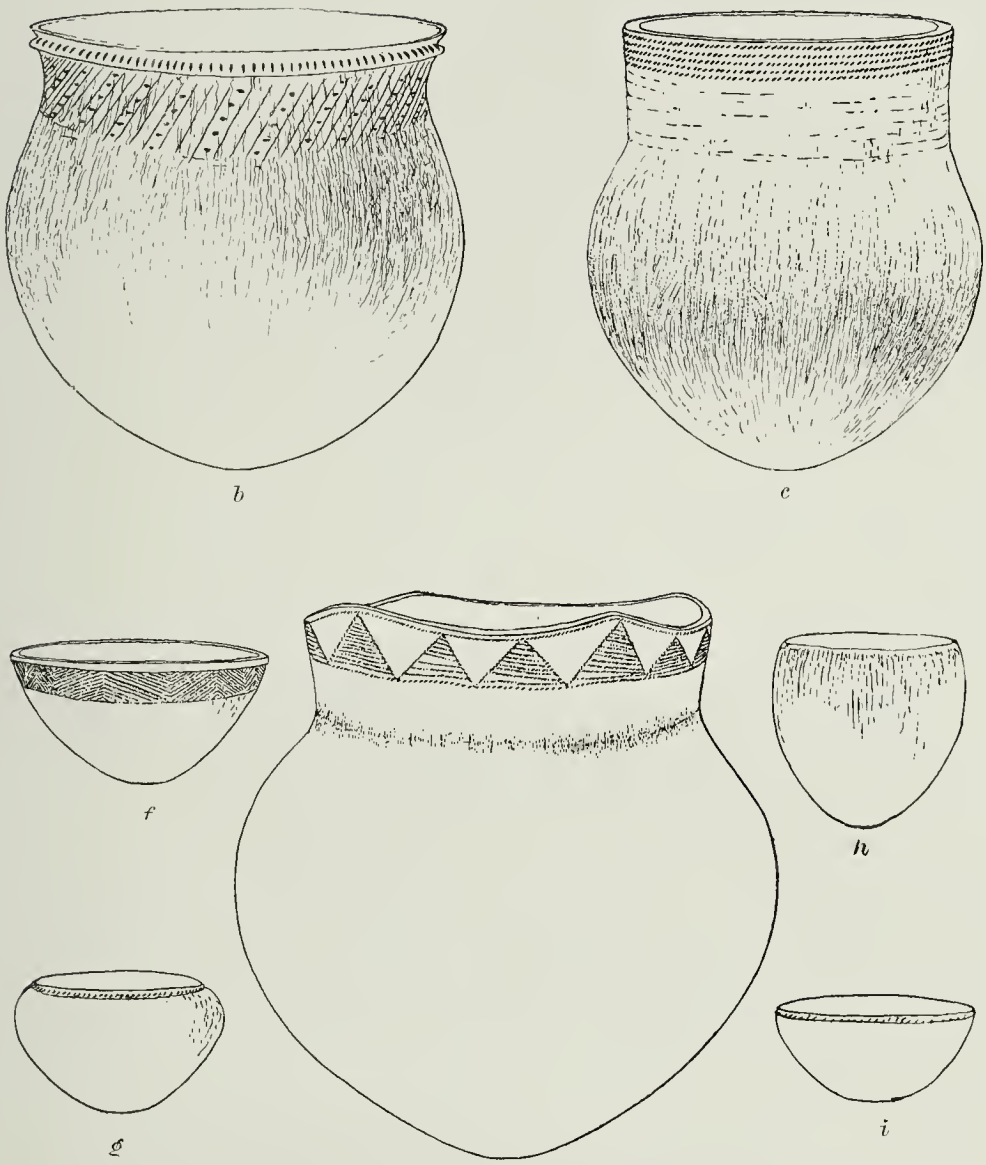


e

POTTERY FROM POTOMAC CREEK, VIRGINIA, AND ANACOSTIA, DISTRICT OF COLUMBIA

CHESAPEAKE-POTOMAC GROUP

HELIOTYPE CO., BOSTON.



b *c*

f *h*

g *i*

a (DIAMETER ABOUT 10 INCHES)

d *e* (DIAMETER 6 INCHES)

POTTERY FROM THE VICINITY OF WASHINGTON, DISTRICT OF COLUMBIA
(RESTORED FROM FRAGMENTS)

CHESAPEAKE-POTOMAC GROUP

convey a correct idea of the art as practiced by the prehistoric Washingtonians. Outlines of several vases are presented in plate CXLI, and photographic reproductions of fragments are given in *c*, *d*, *e*, plate CXL. The fragment *c* is a part of the vessel outlined in *a*, plate CXLI. It was found on a village site which was partly destroyed in building the south abutment of the Pennsylvania avenue bridge across the Anacostia river in 1890. The shape was pleasing and symmetric, and the surface was well smoothed, though not highly polished. The simple ornament about the scalloped rim consists of cord imprintings arranged in a series of connecting triangular spaces. The mouth was about 9 inches in diameter.

It may be mentioned as a curious fact that as we approach the head of tide water on the Potomac and enter the district furnishing soapstone we observe the influence of this material on both the paste and the form of the earthenware. The sites about West Washington contain many sherds tempered with pulverized steatite, and the vessels to which they belonged were, in cases, supplied with rude nodes set a little beneath the rim, closely resembling the handles characterizing the steatite pots of the same section. From this circumstance it is clear that the making of pottery and the working of the soapstone quarries were contemporaneous events, a fact shown also by the intermingling of articles of both classes in the débris of many village sites.

In figure 61 a rudely modeled doll-like figure from the Phillips collection is shown. It is from one of the Potomac river sites, and is the only example of its kind so far found in the whole province.

WARE OF THE CHESAPEAKE AND EASTERN SHORE

A description of the sherds of an average Potomac river site could be repeated without essential change for those of an average site on the shores of Chesapeake bay. At Riverton, on the Nanticoke, for example, the general features of form, size, color, fragility, finish, and decoration are repeated. Minor differences are observed in many cases. Incised decoration takes the place, in a measure, of the cord-imprinted figures of Potomac creek. Shell tempering prevails, and the wrapped-cord paddling and rouletting takes the place largely of cord texturing. Net impressions are comparatively rare. The plain and indented rim, the conic base, and the combed interior surface observed in the Potomac wares are repeated here.

In advancing to the north we come to realize that gradually a change is taking place in the character of the ware, and that the change is toward the characteristics of the work of the Iroquoian province. The scalloped rim and the peculiar arrangements of incised lines take on northern characters. We have thus, as in other cases, indications of

the close association in some way or other, peaceable or warlike, of the occupants of neighboring northern and southern provinces.

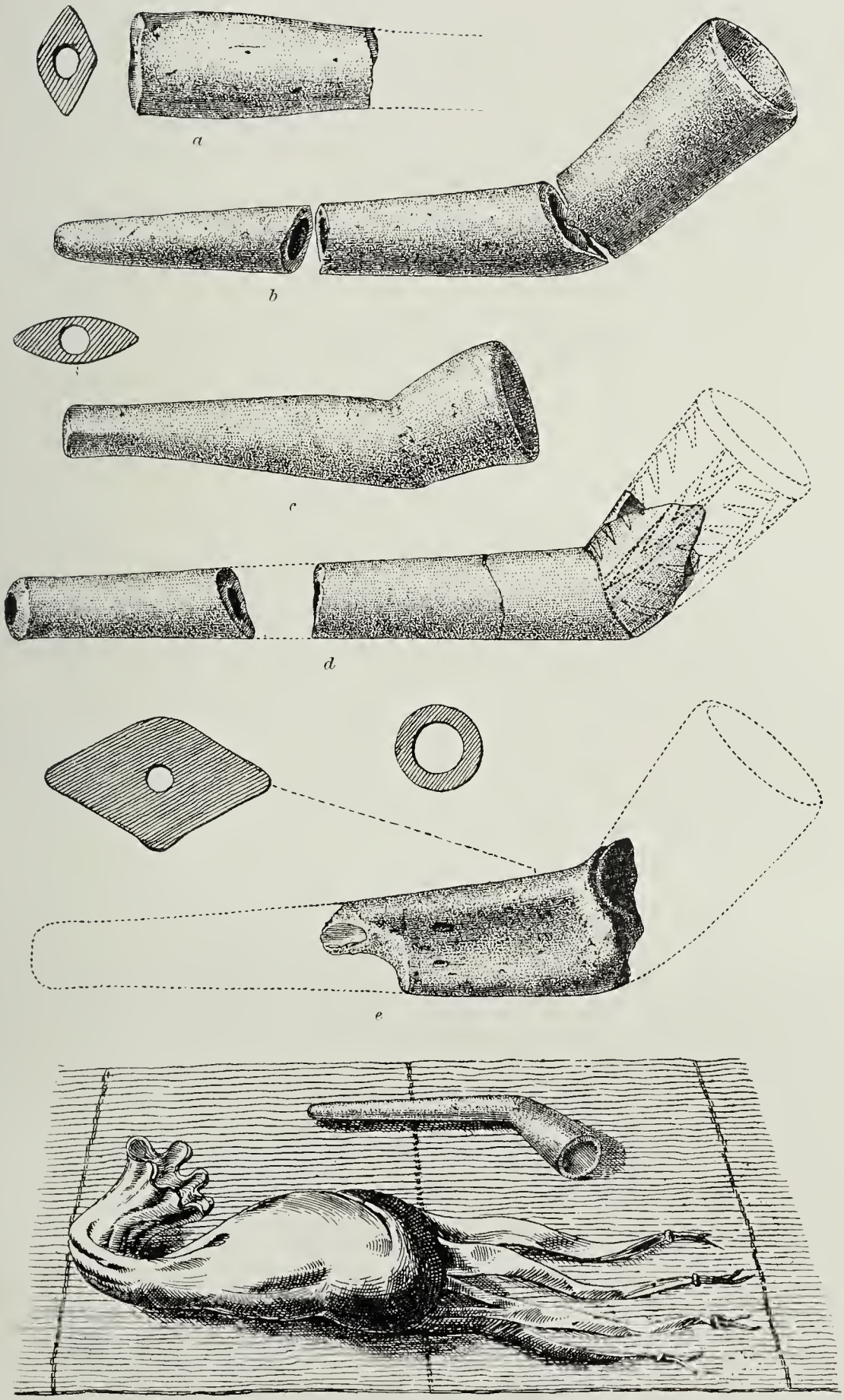
Collections from the upper Maryland and Delaware districts are extremely meager, and it is impossible now to trace in detail the transitions that take place between the drainage of the Potomac and that of the Susquehanna and between the latter stream and the Delaware.

Tobacco Pipes

Although it was Virginia, possibly, that gave to England the form of tobacco pipe largely adopted there and most used by the whites generally throughout the three centuries that have elapsed since the founding of Raleigh's colonies, the clay pipes of the Virginia province are of the simplest possible type. They are slightly bent tubes from 4 to 6 inches in length, having gently expanding bowls less than 2 inches long, and stems that taper slightly to a neat mouthpiece. They are not unlike some forms of cigarette or cigar holders of the present period. The stem, in cases, is flattened so as to be held easily between the teeth or lips, as is indicated in the sections in plate CXLII *a* and *c*. The finish is of all grades between rude smoothing with the fingers and an excellent polish. The paste is usually very fine grained, the baking is often excellent, and the colors are the ordinary warm grays of the baked clay.

Ornament is seen only in rare cases; some specimens have a slightly relieved band about the bowl, and in a very few instances indented designs are observed. The bowl of the specimen shown in *d* has been decorated with an extremely neat design of the usual style of the region, applied apparently with a delicately notched roulette. The inside of the bowl and stem is usually blackened by use. It is a fact worthy of note that many of the sites yield fragments of pipes of much the same size and general style, which are made of pure white clay and bear indications of having been pressed in molds after the fashion of our ordinary clay pipes. This would seem to indicate that the whites took to making pipes for trade while yet the shores of the Potomac and Chesapeake were occupied by the native villagers. I will not enlarge on this subject here further than to present an illustration of a pipe and tobacco pouch, *f*, copied from a plate in Hariot's Virginia. The pipe is identical in shape with the clay pipes of the region as here illustrated, and we have the good fortune thus to be able to connect the historic tribes of the Roanoke province with the sites supplying nearly all of our archeologic material.

Pipes of this class are confined pretty closely within the South Algonquian province. The change from the wide rimmed, sharply bent clay pipe of the South Appalachian province is quite abrupt; but on the north the change is somewhat gradual into the more elaborate and elegant pipes of the Iroquois.



f (ACTUAL SIZE)

TOBACCO PIPES OF THE POTOMAC VALLEY

CHESAPEAKE-POTOMAC GROUP

POTTERY OF THE IROQUOIAN PROVINCE

The Iroquoian Tribes

The group of tribes now classed, on the basis of language, as Iroquoian, constituted one of the most important grand divisions of the aborigines of North America. The central culminating event in their history was the formation of the league, which included at first five nations and finally six. The seat of this great group of communities was in New York, but their strong arm was felt at times from Nova Scotia on the east to the Mississippi on the west, and from the drainage of Hudson bay on the north almost to the Gulf on the south. There were several outstanding tribes of this stock not absorbed by the league—the Conestogas on the lower Susquehanna, the Cherokees in the Carolinas and Georgia, the Wyandots along the St Lawrence and the Great lakes, and others of less prominence in other sections. All save the Cherokees were surrounded by tribes of Algonquian stock. The cultural remains of this strongly individualized people constitute a well marked group of art products, fully identified and correlated with the makers. These remains are central in New York, in which state the types are found, but they extend out into the neighboring states, where they gradually lose their typical character. The tracing of the peculiarly Iroquoian art and art influence from center to circumference of the great province occupied, is a matter of very considerable importance to the historian of the aborigines, but little has been done as yet in a systematic way toward carrying out the work. Morgan, Schoolcraft, Hale, Boyle, Beauchamp, Harrison Wright, Perkins, Squier, Thomas, Cushing, and many others have contributed not a little, though most of the work has been fragmentary.

General Characters of the Ware

Pottery constitutes the most important feature of the Iroquoian remains. In general, it falls in with the simple ware of the northeastern states, but at the same time it presents numerous striking and distinctive characteristics of shape and decoration. Within the group there are many local variations in form, ornament, and composition, indicating the existence of somewhat marked tribal peculiarities, and it may be possible in time to segregate the work of some of the stronger tribes, such as the Onondagas and the Mohawks, who dwelt for a long time in limited areas. The Cherokees and Tuscaroras had for generations or perhaps centuries been completely isolated from their kin, and their work was thus highly distinctive.

The Iroquois did not dwell largely on the Atlantic seaboard, but occupied the shores of the lakes, especially Lake Ontario. Their favorite resorts, however, were along the rivers and on the banks of the hundreds of charming upland lakes in New York state. The

question of the influence of the sea and of the lake environments upon their art, as distinguished from that of the great interior upland, has been raised by Mr Frank H. Cushing, who gives his observations and deductions with respect to this obscure but interesting matter in a paper published in Memoirs of the International Congress of Anthropology at Chicago.[a] At present I do not feel qualified to discuss the question, lacking the necessary knowledge of the peoples and environments concerned. It is possible that the Algonquian Indians may be responsible for most of the shore work, and the Iroquois responsible for the art of the inland and upland districts, which would account for most of the differences. We are not able to determine the precise effect of environment on an art until we have made full allowance for peculiarities of peoples and difference in period.

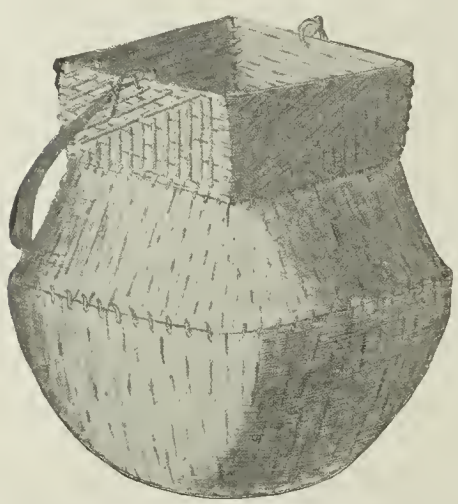


Fig. 62—Bark vessel showing characters sometimes copied in clay by Iroquoian potters.

When the French entered the great St Lawrence basin the Iroquoian tribes were actively engaged in the practice of the plastic art, but its total abandonment was quickly brought about by the introduction of utensils of European manufacture. That these peoples had dwelt for a long period in this general province, and that their arts, as developed at the time of Columbus, were largely of local evolution, seems highly probable, and the stamp of local environment is especially marked in the potter's art. The accompanying map, plate IV, indicates in a general way the distribution of the Iroquoian pottery.

In the various groups of plastic products previously examined, the vessel in its numerous forms is the leading feature, and in some cases it is almost the exclusive feature of the fictile remains. In the Iroquois region it is different. The art of tobacco pipe making shared the honors with vase making, and led to an elaboration of plastic forms and to a refinement of manipulation seldom surpassed within the area considered in this paper. Life forms, rarely imitated by the surrounding Algonquian tribes, were freely employed by the Iroquois.

The strongest characteristics of the earthen vessels, and those which may best be relied on to distinguish them from all other like wares, is the pronounced projecting or overhanging collar—a frieze-like development of the rim—the outer surface of which was almost always ornamented with incised patterns. A squarish mouth, with elevated

[a] Chicago, 1894, p. 216.

points at the corners and sagging margins between, is also a marked feature, and the sharp constriction about the neck and the gracefully swelling body, conic below, are hardly less pronounced and valuable group characters. It is possible that some of these features owe their origin to the bark vessels of the same region. This idea is presented by Cushing in the Fourth Annual Report of the Bureau of Ethnology,[a] from which figure 62 is reproduced. In the application of the human face or form in relief, we have another group index of the highest value. The angles of the frieze are very often emphasized by enlargments, projecting ridges, and raised points, and to these the plastic life features, mostly human, are added.

Besides the large percentage of vases presenting these characteristics, there are many of rather plain appearance that might not, if placed with vessels of Algonquian type, be easily distinguished save by the expert. Many are round-bodied and wide-mouthed, with inconspicuous lips. Some are bowls and others mere cups, the latter often quite minute. Leading features of form are brought out to good advantage in the numerous illustrations accompanying this section.

Materials and Manufacture

The materials used were usually mixtures of clay and rather coarse tempering ingredients, in typical localities mostly silicious. The Iroquois occasionally used pulverized shell, as did their neighbors, the Algonquians, but they seem to have preferred pulverized rock of crystalline varieties. Respecting the securing and selecting of the ingredients, and the levigating, mixing, and manipulation of the paste, but little can be said. Evidences of the nature of the building processes are obscure, but there is no reason to suppose that other than the usual methods were employed.[b] The walls were probably built up of bits and strips of clay welded together with the fingers and worked down and polished with scrapers, paddles, and rubbing stones. The surface of the convex body of the vessel was sometimes finished by malleating with a textile-covered paddle or by rouletting with a cord-wrapped tool. The rim was added, and was then squared or rounded on the margin and polished down in preparation for the use of the graver and the tubular or pointed punch. The paste for large vessels was often quite coarse, but for the smaller pieces and for most pipes pure clay of the finest quality was employed.

The baking was conducted in shallow pits or on the surface of the earth, and in usual ways, no doubt, for the ordinary fire mottling is observed. No great degree of heat was applied.

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[a] P. 520.

[b] For a very carefully made experimental study of this subject, see F. H. Cushing's article, The germ of shoreland pottery, in the Memoirs of the International Congress of Anthropology, Chicago 1894.

Color, Form, and Size

The colors of this ware are the colors of the baked clay; where it has not changed by use or age, grays of yellowish and reddish tones, rarely approaching a terra cotta, prevail.

In the matter of size these vessels have not the wide range of the more southern varieties. There are very few large pieces, and few very small ones. A height or diameter exceeding 12 inches is unusual. Small toy-like cups are occasionally found.

To the student of the many and varied ceramic groups of aboriginal America, a most notable feature of this, and of the Algonquian ware as well, is the marked simplicity of the forms. As the vessels were based on simple models and employed for a limited range of uses, there has been little tendency toward elaboration or differentiation of shape. The art as practiced here must have been still very near its origin—young as compared with the potter's art in the South. The only form prototypes that appear, and these are strongly suggested by the shapes of the vases, are the bark vessels and baskets in common use in the region. All are forms of use, yet a certain rude grace characterizes the outlines. The narrow limitations of form are indicated by the absence or rarity of bottles, bowls, plates, animal figures, compound shapes, flat bottoms, handles, feet, and pedestal-like additions.

Ornament—Plastic, Incised, and Relieved

The decoration of Iroquoian earthenware is simple in execution, and limited in range of subject matter, indicating a people yet near the threshold of their esthetic career. This archaic simplicity is not so pronounced, however, in the treatment of plastic details as it is in the linear designs.

The forms of vessels are considerably varied within a limited range, and convey the notion, in many cases, that the makers had conceptions akin to our own with respect to proportion and grace; yet we are unable to say how much these qualities are due to suggestions acting within the art, and how much is the result of conscious appreciation of the esthetic in contour. Forms of tobacco pipes are often interesting and graceful. Nearly all are modifications of the trumpet shape, and the representations of living creatures so freely employed are generally added without serious detriment to the fundamental shape. The plastic additions to vases are also executed in a way to indicate the existence of restricting forces, traditional, esthetic, or otherwise, tending to hold the potter to simple, consistent models. This is in strong contrast with the employment of life features by the potters of the middle and southern provinces, where variety is endless and consistency is often disregarded. The rim-collar or frieze is often divided into two, three, or four parts by salients or ridges, and the modeled life-shapes

are confined strictly to these features, adding emphasis to the form without reducing the simplicity or overburdening the vessel. Plastic ornaments comprise ridges, nodes, projecting points, medallion-like heads mostly or exclusively of men, and more or less complete figures of men. Mr Cushing has observed modifications of the ornamental ridges at the corners of the frieze which seemed to him to make them represent ears of corn. The modeling was done with the fingers, aided by modeling tools; the latter were used mainly in indenting, incising, and polishing. The fact that the life-forms employed in vase modeling are confined almost universally to the human subject is worthy of note, since in modeling pipes many varieties of animal were employed. The idea is thus emphasized that pipe making and vase making, though practiced by the same people, must have been carried on under somewhat different conditions or at periods not fully coincident. It is not unlikely that superstition gave rise to the use of these life-forms, and restricted them to the places on the vases and pipes to which they are so scrupulously confined. The women probably made the vases, but the pipes, it is surmised, were made by the men.

The archaic, rectilinear decorations of this pottery are in strong contrast with the graceful and elaborate designs of the South and West. So far but few curved lines have been observed, and the current ornaments, such as the scroll, the fret, and the meander, were wholly unknown. So elemental are the motives that they may safely be regarded as illustrating the first steps of these people in freehand ceramic decoration, though they were doubtless familiar with textile embellishment at a much earlier period. Textile texturing is not uncommon, and, in cases, nearly the entire body of the vase is covered with impressions of cords or coarse cloth applied by paddling or by some other method of malleating or imprinting. I am not certain that any specimen examined by me has markings made by handling the plastic vessel in a net or other inclosing fabric, as has been suggested by Mr Cushing's experiments already referred to.

The formal pseudotextile ornamental designs consist of straight incised lines and indentations arranged in simple combinations, forming encircling zones, generally around the frieze, but in cases around the body of the vase. The zones are usually bordered by parallel lines and marginal rows of indentations or notches, interrupted in the frieze by relieved features placed at intervals, dividing the space into two, three, or more sections. The margin or lip is rounded, square, or sloping, and is embellished with indents, punctures, or short lines, and the lower margin of the frieze is variously finished with a band of short lines, indented circlets, notches, indents, or relieved bead-like points.

The execution is varied. The lines were incised with an acute or rounded point, sometimes forced rudely through the clay, leaving a

ragged line, and again trailed across the surface, giving a comparatively smooth channel. This, in the finer work, is gone over again and again to give it a smooth finish or polish. In cases, the effect seems to indicate that a curved edge was rolled back and forth, leaving linear indentations, and again that a notched or dentate edge, as of a wheel, was rolled along the line, being reset for each line, and not rolled back and forth in a zigzag, as the common roulette was. The skill exhibited in the use of the various decorating tools in the making of pipes is exceptional, and, in cases, remarkable. In rare instances the decorating tools took the character of small stamps, the figures being squares in relief, made by cutting cross grooves on the end of a stick or the face of a paddle.

The use of colors in ceramic decoration had not, so far as we can discover, reached the Iroquois country proper, and the very general use of intaglio and relieved decoration indicates that the plastic methods were exclusively employed.

In plates CXLIX–CLII a number of examples of the grouping of incised and indented lines and attendant plastic features in the decorated zones of the vessel are brought together. The combinations are essentially the same throughout the Iroquoian province, and the nature of local variations may be seen by reference to the plates.

Distribution and Characters of Specimens

SOUTHERNMOST OCCURRENCE

In passing up the Chesapeake and Potomac valleys, where Algonquian forms of earthenware are encountered on every village site, the archeologist begins to observe the occurrence of strange features in the ceramic remains on the Chesapeake about the head of the bay, and on the Potomac about the mouth of the Shenandoah. In the vicinity of Romney, West Virginia, the burial places have yielded numerous specimens of Iroquoian ware, not, however, wholly typical in every respect. These are intermingled, apparently, more or less intimately, with pieces that resemble in a general way the Algonquian vases. The scalloped expanding rim, with its frieze of groupings of straight incised lines, is present, and leaves no doubt as to the placing of most of the specimens. In plate CXLIII illustrations are given of finds at this place; they are from the collection of Mr Warren K. Moorehead, who visited the locality in about the year 1890, a period at which the freshets of South fork had exposed the contents of numerous graves. The general region is one likely to have been occupied, temporarily, at least, by the tribes inhabiting New York and Pennsylvania, and it is probable that the Tuscaroras passed this way on their journey northward to join their brethren of the League. The execution of the vases is rude, and the frieze is rather heavy for the weak body, but the lines are not, as a whole, ungraceful. Identical wares are obtained



a (HEIGHT 4½ INCHES)



b

POTTERY FROM A BURIAL PLACE NEAR ROMNEY, WEST VIRGINIA

IROQUOIAN GROUP

(MOOREHEAD COLLECTION)



a



b



c



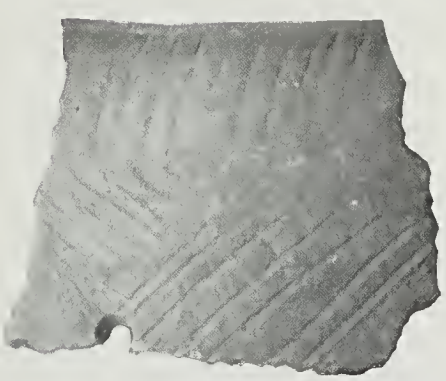
d



e







f

POTTERY FROM A VILLAGE SITE AT BAINBRIDGE, PENNSYLVANIA

IROQUOIAN GROUP

(ABOUT ONE-HALF)

from Cavetown and other localities in northern Maryland. The pipes, though resembling the south Algonquian forms, are like those of northern Maryland and southern Pennsylvania, and are distinctly Iroquoian.

LOWER SUSQUEHANNA POTTERY

The occupation of the lower Susquehanna by tribes of Iroquoian stock might be readily proved by the ceramic remains of that region, if history were entirely silent on the subject. The peoples to whom this earthenware belonged were possibly the Susquehannocks of John Smith, but very probably were the Conestegas of later times, a people not connected with the League, and at war with some of the League tribes. The last remnant of these people were the unfortunate villagers of Conestoga, who were massacred there and at Lancaster by the Paxton boys only a hundred and fifty years ago (1755).

From a village site near Bainbridge, on the Susquehanna, Mr Galbraith obtained a number of broken vases and sherds which came into the possession of the National Museum. These are of familiar types of form and decoration, as will be seen by reference to plate CXLIV. Pulverized mussel shells were used in tempering the clay, and in cases the percentage of this ingredient is very large. We have here, as elsewhere, the small body, the scalloped rim, the heavy overhanging collar, and the archaic arrangements of incised lines. There are also the rather rudely modeled faces, two or four in number, projecting from the angles of the frieze (*a*, *b*, and *c*); and a somewhat unique feature is the enlargement of the notched lower margin of the frieze into pendant points, marked with incised lines, as is seen in *d* and *e*. The diameter of this vase is about 10 inches. The surfaces are imperfectly smoothed, as if rubbed down with the finger tips rather than with a polishing tool; and there are traces of textile imprints on the body and neck, as if a cord or fabric-covered tool had been used in malleating the surface. The incised lines are rather carelessly drawn, and the modeled faces are extremely elementary.

The extension of this ware into eastern Pennsylvania and New Jersey has not been recorded, although Warren county, in northwestern New Jersey, has furnished examples of vases, preserved in the collections of the Academy of Sciences, Philadelphia, which have the overhanging upright collar, not, however, typically developed and not decorated in the Iroquoian style. The tempering is silicious, the treatment rude, the walls thick, and the bodies long and conic below. The bodies are finished with textile-like impressions, and they have Algonquian rather than Iroquoian characters.

POTTERY OF NORTHERN PENNSYLVANIA AND NEW YORK

The Wyoming Historical and Geological Society of Wilkesbarre, Pennsylvania, located in the midst of the Iroquoian territory, has been

exceptionally fortunate in securing several specimens of these vases in an excellent state of preservation, and descriptions and illustrations have been published in the proceedings of the Society by Dr Harrison Wright. I have had seven examples reengraved from the Proceedings of the society, where they were published by Dr Wright, along with valuable descriptive matter.

The fine and unusually large specimen shown in plate CXLV *a* was found among the rocks at the Falls of the Wallenpaupack, Hawley, Wayne county, Pennsylvania, about forty miles northeast of Wilkesbarre, by Alonzo H. Blish, in 1847. The specimen shown in *b* was found by Weston Goss, July 12, 1879, under a rock, about one and a quarter miles from the Allen settlement, Lake township, Luzerne county, Pennsylvania. This is about fifteen miles west of Wilkesbarre. The striking little vase shown in *c* was taken from an Indian grave on the site of an extensive burying ground in Plymouth township, Luzerne county, Pennsylvania, about one mile west of Wilkesbarre, and presented to the Wyoming Historical and Geological Society by Mr John Kern. The symmetric pot illustrated in *d* was found by Asa L. Dana, in the year 1836, in a cave in Eaton township, opposite Tunkhannock, Wyoming county, Pennsylvania, about thirty miles north of Wilkesbarre.

The neat little vessel shown in plate CXLVI *a* is described as Tioga vase 1 by Mr Wright, and was obtained from a grave near Athens, Bradford county, Pennsylvania. It had been placed near the head of a body buried there, and had associated with it a "lapstone," and a rude arrow point of local type. The mouth of the vessel is elliptical, 4 by $3\frac{1}{2}$ inches in dimensions, the rim is carried up in rounded projections at opposite ends, and is embellished without by a simply modeled human face, signalized by a headdress or notched fillet, flowing gracefully to the right and left.

From another grave at the same place, and similarly placed with respect to the skeleton, we have the exceptionally interesting piece presented in *b*. It is notable for the abrupt battlement-like elevations placed at opposite sides of the rim, and also for the double zone of decoration. Several other vessels in a more or less fragmentary state, and less typical in shape, were recovered from graves at this point. It is interesting to note that these graves are on a tract of land purchased by the Susquehanna company from the Iroquois in 1754.[a]

The vases shown in *c* and *d* are from the general region under consideration, but the exact locality is not recorded.

In plate CXLVII *a* is given a handsome vessel with very unusual decoration. It is from the vicinity of Wilkesbarre and was found by Mr Jacob Cist in the early part of the nineteenth century. The decorative patterns resemble textile patterns, and have been worked out with

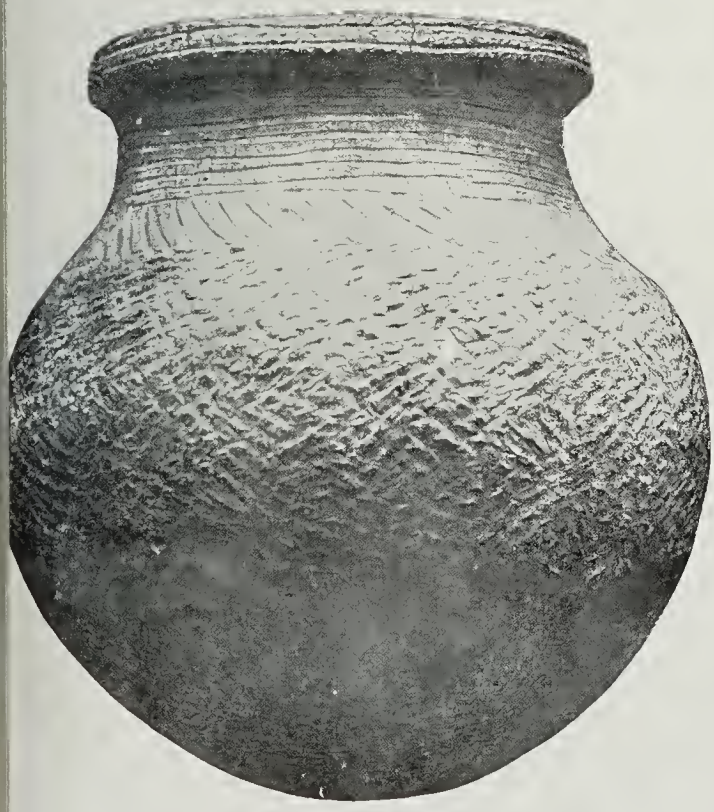
[a] Wright, Harrison, Report of the special archæological committee on the Athens locality in Proc. and Coll. of the Wyoming Historical and Geological Society, Wilkesbarre, 1886, p. 59.



b (HEIGHT 6¼ INCHES)



c (HEIGHT 6 INCHES)



d (HEIGHT 7 INCHES)



a (HEIGHT 13 INCHES)

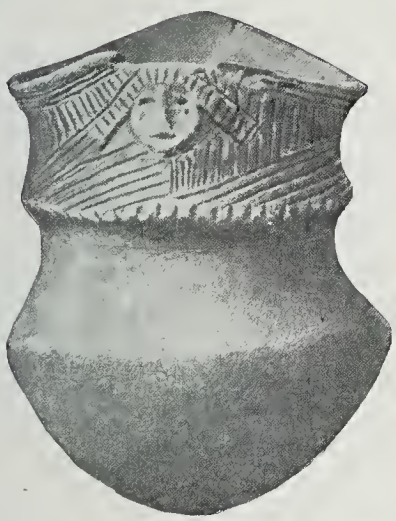
VASES FROM GRAVES, NORTHERN PENNSYLVANIA

IROQUOIAN GROUP

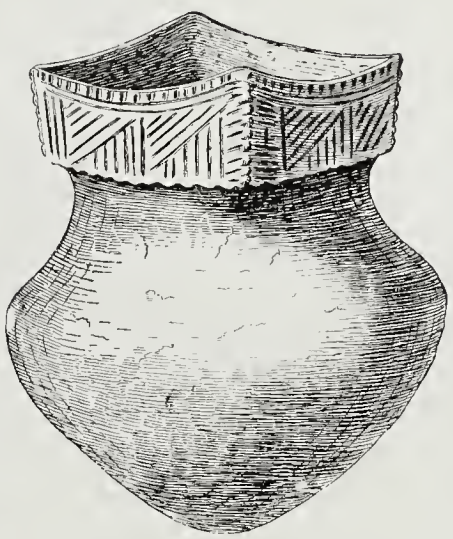
(WYOMING HISTORICAL AND GEOLOGICAL SOCIETY COLLECTION)



b (HEIGHT 5⅛ INCHES)



a (HEIGHT 4¾ INCHES)



d



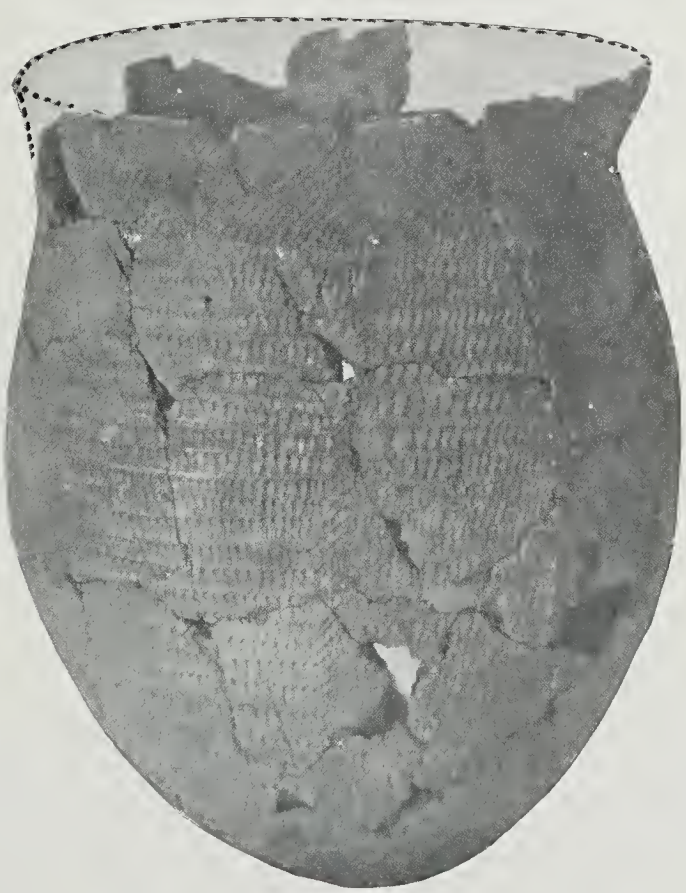
c

VASES FROM GRAVES, NORTHERN PENNSYLVANIA

IROQUOIAN GROUP



a (HEIGHT 8 INCHES)



b (HEIGHT 11 INCHES)

VASES FROM GRAVES IN PENNSYLVANIA AND NEW YORK

IROQUOIAN GROUP

A typical example of this ware from Vermont was illustrated and described by Mr Perkins in the American Naturalist, vol. v, p. 14, and again very fully described in the Proceedings of the American Association for 1876. The specimen was found at considerable depth below the surface of the ground, in the town of Colchester, Vermont, in 1825. It is remarkable for strongly emphasized contours, symmetry, careful finish, and elaborate ornamentation, and is in every way typical of the group. An excellent cut of it appeared in Harper's



Fig. 64—Vase from a grave (?) in Colchester, Vermont.

Magazine, vol. LXV, p. 254. The illustration here presented, figure 64, is from a photograph of a cast of this vase, now preserved in the National Museum. The rim has been partially restored.

CANADIAN WARE

In historic times, and for an unknown period of pre-Columbian time, the Iroquoian tribes occupied a wide belt north of the St Lawrence river, Lakes Erie and Ontario, and their dominion extended at times over the Lake Huron region, and into the country about Lakes Superior and Michigan. As a matter of course the region is strewn with the fragments of their earthenware, which bears throughout the

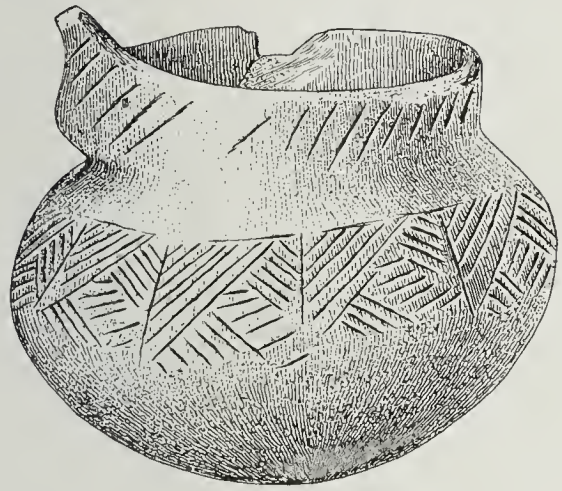
peculiar characteristics of Iroquoian art. There are many variations, however, of shape and decoration, as a number of tribes, the Hurons, Eries, etc., and, later, the Wyandots, occupied the region.

Ontario is especially rich in fragmental ceramic remains, and through the praiseworthy efforts of the Canadian Institute and other learned bodies of the Dominion, and especially of Mr David Boyle, of Toronto, many specimens have been collected and preserved, and numerous illustrations and descriptions have been published. I shall be able only to glance at these products, leaving all the details to those who have the opportunity for working personally in the various regions.

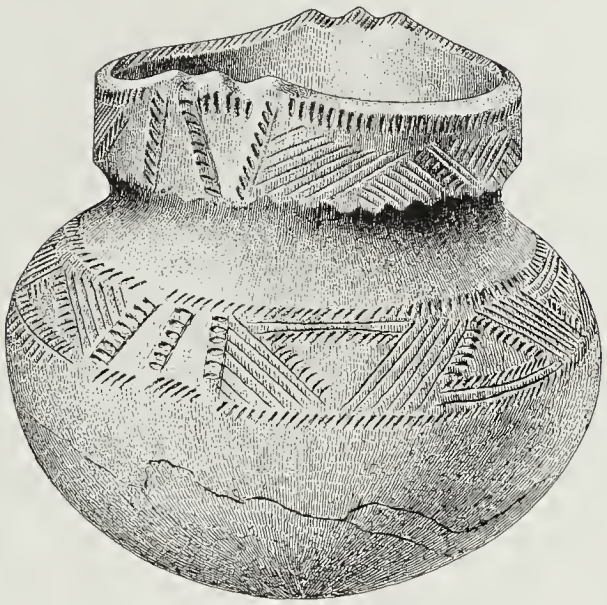
The earliest publication of illustrations of Iroquoian pottery was made by Mr W. E. Guest, in the Smithsonian Report for 1856, p. 274. Many fragments were found in or near an ancient earthen inclosure at Spencerville, a few miles north of Prescott, Ontario, and the cuts published by Mr Guest are restorations, a little defective in outline, perhaps, as the base is more nearly flat than is usual with this ware. In every other respect their features duplicate those of the typical wares of the Iroquois. Mr Guest also gives illustrations of three small disks made from potsherds, one apparently being perforated, as if for use as a spindle whorl or an ornament. The others are nearly identical with similar objects found plentifully in the southern states, and supposed to have served for playing some game of chance.

Village and camp sites in the Balsam lake region, Victoria county, have yielded to the intelligent efforts of the Laidlaw brothers, residents of the locality, numerous interesting sherds, of which a large series has been illustrated and described by David Boyle in the Fourth Annual Report of the Canadian Institute. In plate CXLVIII is presented a series of vases selected from his work. So typical are all of these in form and decoration that description is unnecessary. There is not a new element, beyond the simple variations to be expected in the art of a single people as practiced at different times or under changing conditions.

The island of Montreal, the site of the ancient Hochelaga, an Iroquoian resort of great importance, furnishes much typical ware of this class. Illustrations are given by Dr J. W. Dawson, in the Canadian Naturalist, volume v, page 435, and in his Fossil Men, page 91. In the latter work is shown also a well-preserved pot obtained from the upper Ottawa. It is not so typical as some others, but has the upright projecting collar somewhat developed, and is finished with vertical and horizontal incised lines. The line of indentations about the upper part of the body is rather exceptional in the central and southern Iroquoian regions, but is repeated in a similar piece from Bruce county, Ontario, and in many of the New England specimens. It is possible, since the



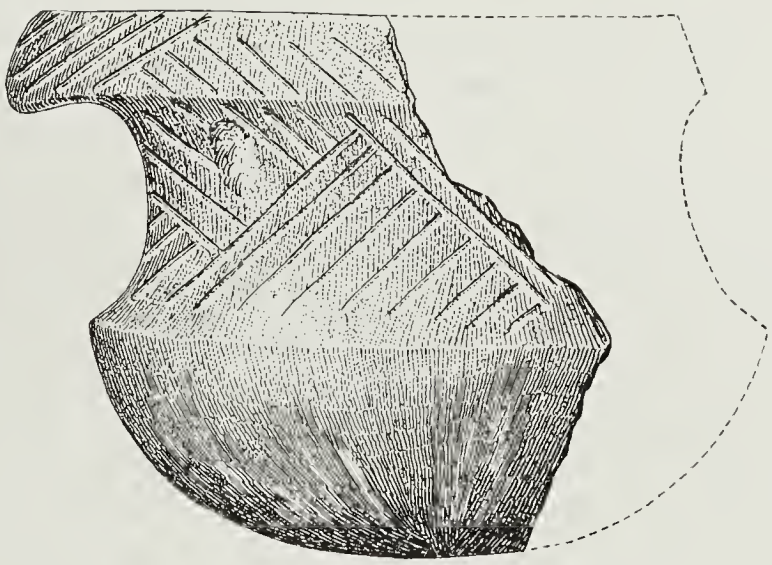
a (DIAMETER 4¾ INCHES)



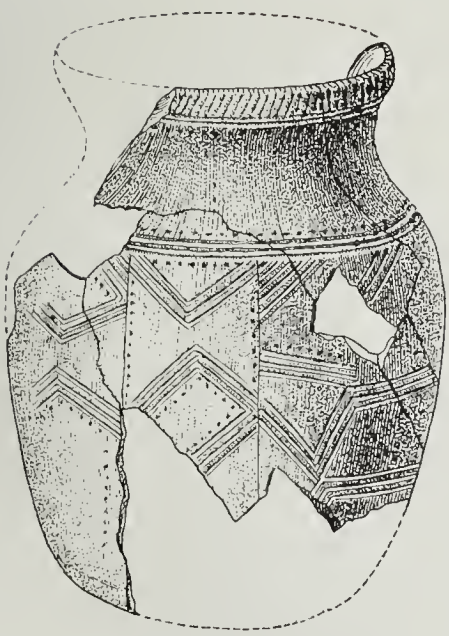
c (HEIGHT 7 INCHES)



b (DIAMETER 3¼ INCHES)



d (HEIGHT 5 INCHES)



f (HEIGHT ABOUT 9 INCHES)



e

VASES FROM THE PROVINCE OF ONTARIO CANADA

IROQUOIAN GROUP

(FROM BOYLE)

Algonquian tribes encroached at times on the northern margin of Ontario, that these vessels may have been modified in certain details by the art of that people.

Mr Boyle, in the Annual Report of the Canadian Institute for 1889, records the discovery of much fragmentary ware along and near the north shore of Lake Erie. It is stated that numerous unusual features of minor importance occur, but, from the descriptions and illustrations given, there is no reason for supposing it other than Iroquoian work. A number of exceptionally large pieces were observed, a diameter and height of 17 inches being noted.

In the same publication Mr Boyle presents a vessel of unusual shape, restored from numerous fragments found by Mr John McPherson on Mindemoya island, northern Lake Huron. This piece is shown in plate CXLVIII *f*. Attention may be called to the fact that it differs essentially from Iroquoian types, and resembles somewhat the Algonquian pottery of the Lake Michigan and Upper Mississippi regions. Since Algonquian tribes occupied this region more fully, perhaps, than the Iroquoian, the probabilities are that this vessel is of Algonquian make.

It is a remarkable fact that in the National Museum there are a number of fragments of typical Iroquoian ware entered as having been found in southern Alabama. Fearing that there may have been a mistake on the part of the curator or his assistants in placing this accession on the books, I will not venture to do more than mention the circumstance. Such an occurrence, if sustained, would be of much interest to students of stock distribution.

Decorative Designs

In plates CXLIX, CL, CLI, and CLII, a series of figures is presented to illustrate the nature and range of the incised and modeled decorations of this pottery. The example shown in plate CXLIX *a* is from a Romney, West Virginia, vase; *b*, *c*, *d*, and *e* are from fragmentary vessels procured from a village site on the Susquehanna, near Bainbridge, Pennsylvania, while *f* and *g* are from Mohawk valley sherds.

The designs shown in plates CL and CLI are mostly from vases in the Wyoming Historical and Geological Society collections, and belong in the Wilkesbarre region. The second figure, *b*, of plate CL, represents part of a zone of ornament encircling a Cherokee split-cane basket, and is intended for comparison with the incised design illustrated in *a*. There can be little doubt that the latter motive was derived almost directly from some similar textile ornament, the art of basketry having been universally practiced by the ancient tribes of the East.

The remaining figures of plates CL, CLI, and CLII serve to indicate the general uniformity and simplicity of the linear designs of the whole province. The employment of double zones of figures is illustrated in the lower figures of plates CLI and CLII. The design in the

latter plate is from the Vermont vase shown in figure 64. The curved lines seen in these figures are not so by design of the decorator, but merely take the curves of the vessel margins with which they were associated.

The manner of introducing life forms is also clearly shown in four instances. The entire human figure, modeled in rather bold relief, is seen in plate CLII *c*. The face, with horizontal markings indicating the place of the body, appears in *b*, and a highly conventionalized treatment of the face is given in *a*. These conventionalized forms are present in great variety. One of the most realistic examples of figure presentation is shown in figure 65. Other figures and a number of rudely modeled faces are brought together in plate CLIII. These ornaments are in all cases attached to the angles of the frieze of square-rimmed vessels, or are placed beneath the elevated points of the round, scallop-rimmed variety. It is probable that these features are recent additions to the decoration, which consisted, originally, of archaic arrangements of lines and dots.

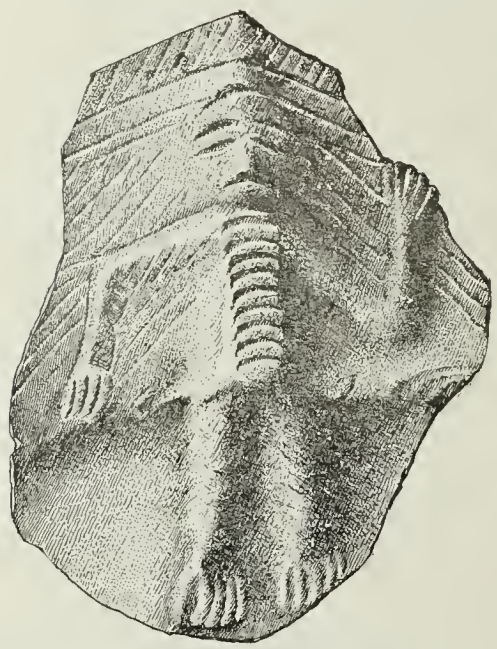


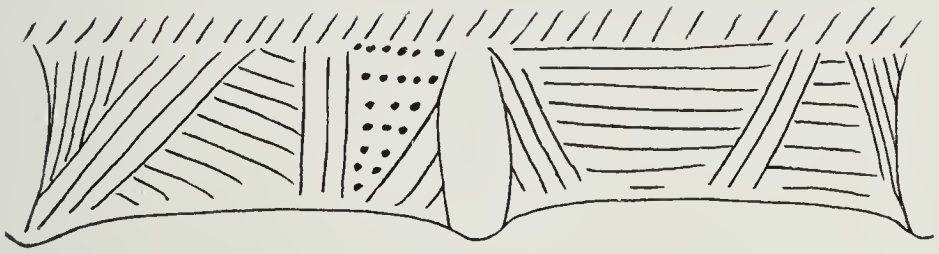
Fig. 65—Fragment of vase-rim with rudely modeled human figure, New York.

Tobacco Pipes

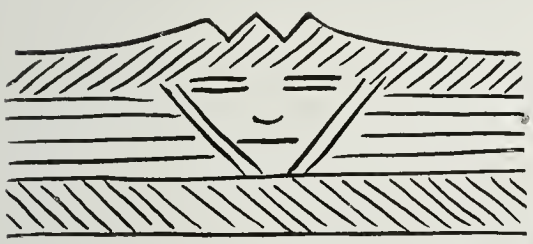
THE PIPE A NATIVE PRODUCT

The American natives were a race of smokers, and the use of tobacco in political and religious ceremonials elevated the pipe to a place of unusual importance among the various products of the shaping arts. Much time, labor, and ingenuity were expended on the manufacture of pipes of stone, and nearly every section of North America has furnished to collectors excellent examples of this class of work.

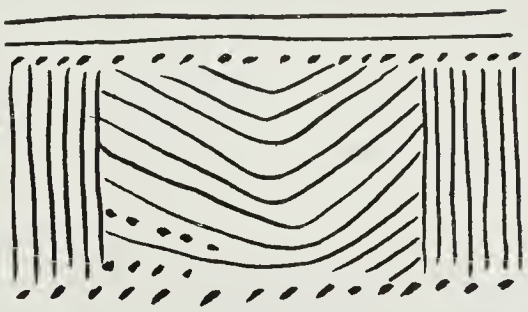
Pipes were also made of wood, bone, horn, and other substances. It is highly probable that the antitype of the pipe was a vegetal form, such as a section of cane or other hollow stem, but, since smoking was practiced in widely separated localities, the earlier forms must have been divers. Clay was very generally employed in this art, and in some sections was in great favor. It is a notable circumstance that the Iroquois took a high rank as pipe makers, excelling all other peoples in the number and quality of these productions. With this



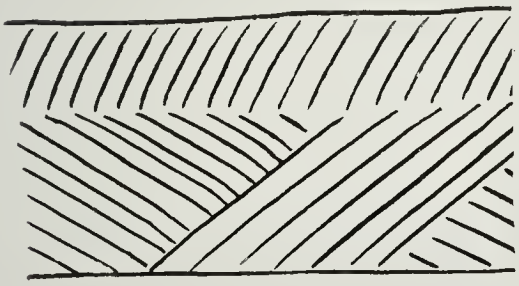
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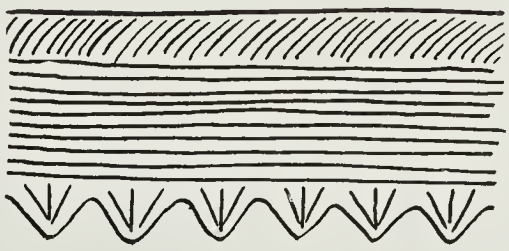
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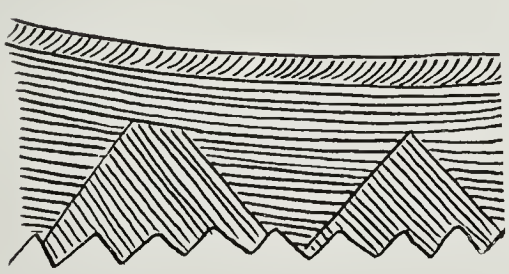
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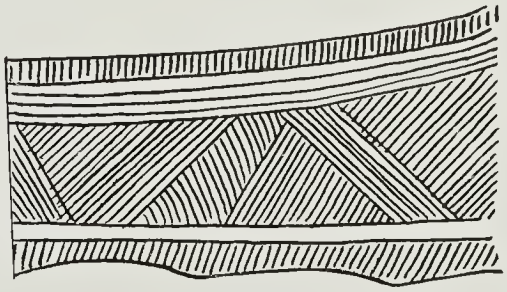
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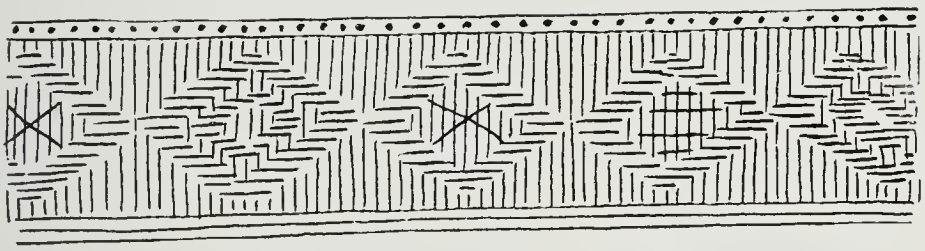
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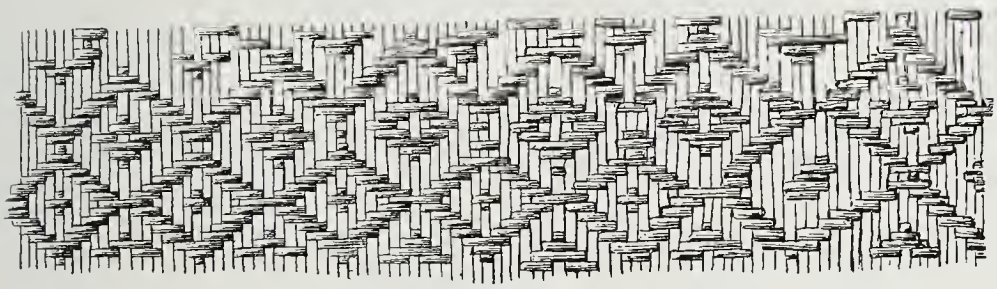
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INCISED DESIGNS FROM VASES

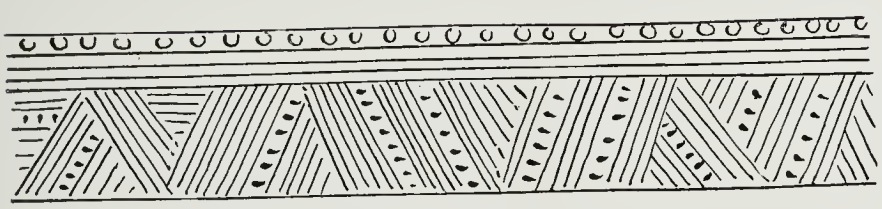
IROQUOIAN GROUP



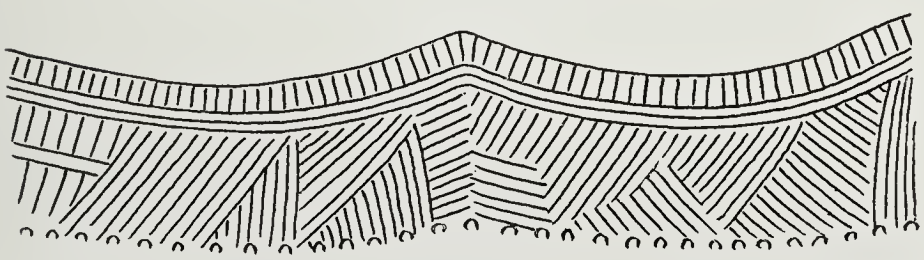
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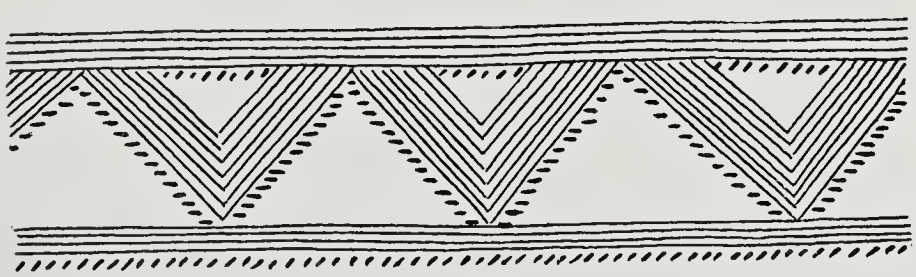
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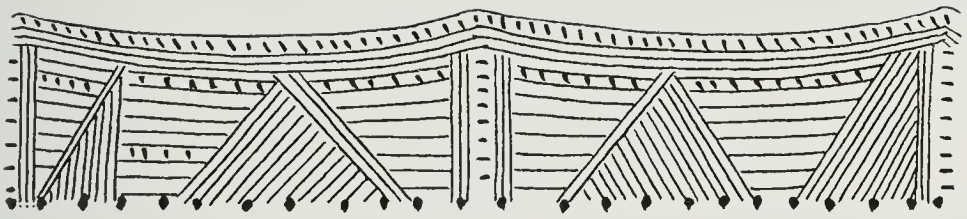
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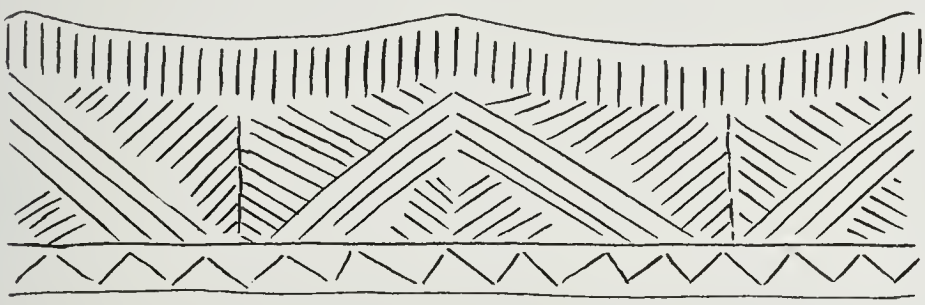
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INCISED DESIGNS FROM VASES

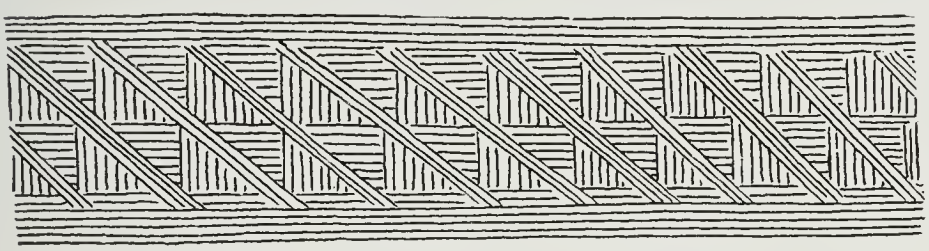
IROQUOIAN GROUP



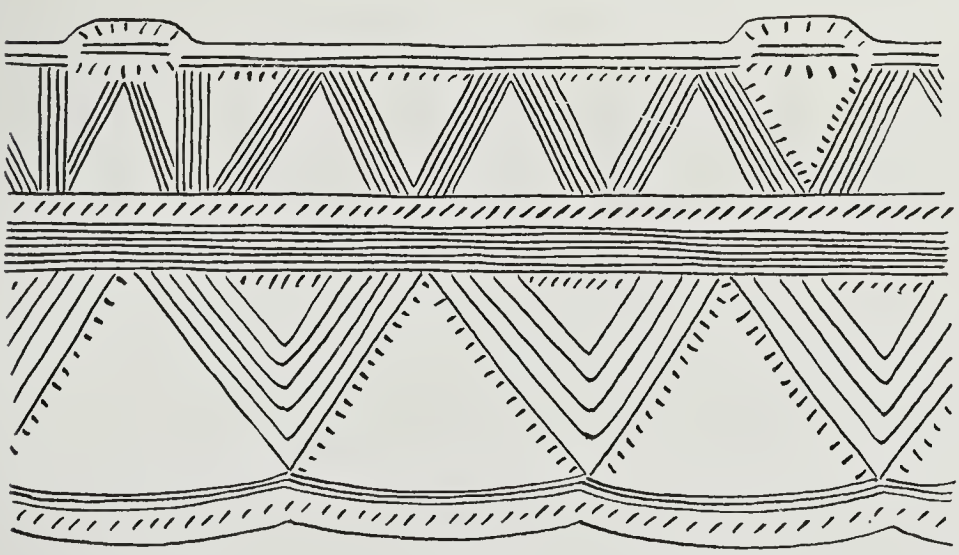
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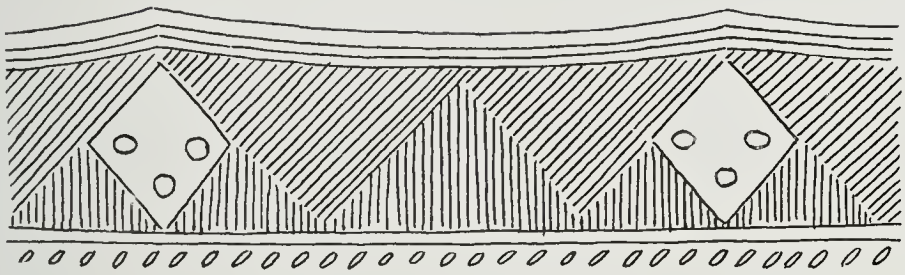
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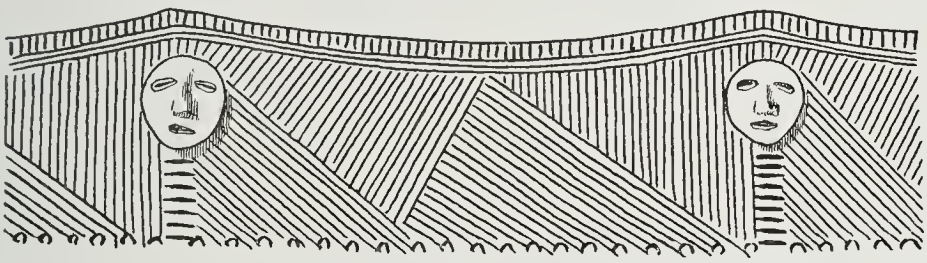
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INCISED DESIGNS FROM VASES

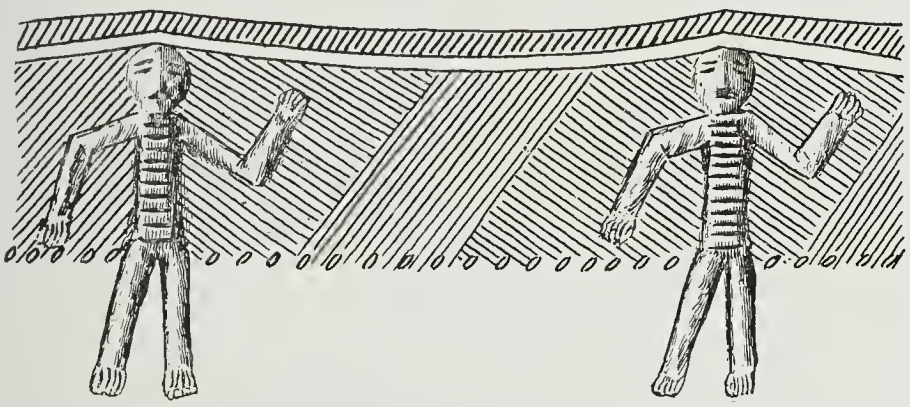
IROQUOIAN GROUP



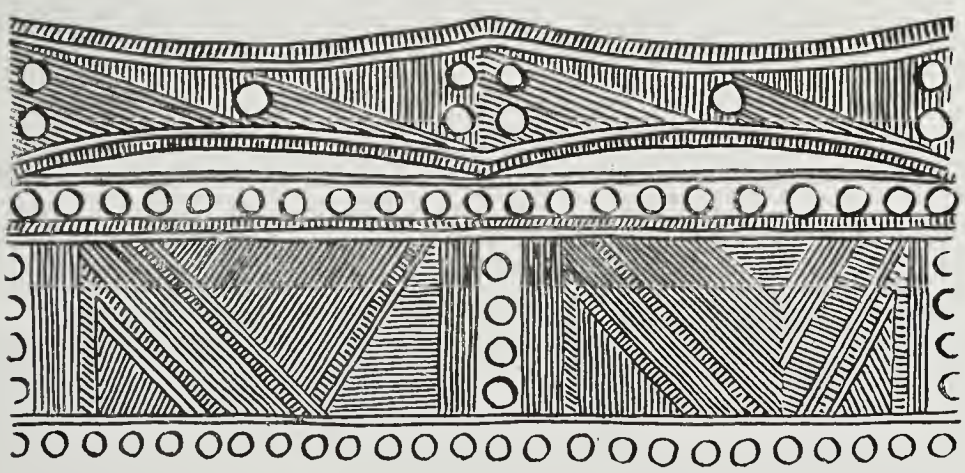
a



b



c



d

INCISED DESIGNS FROM VASES

IROQUOIAN GROUP



FACES AND FIGURES FROM VASES

IROQUOIAN GROUP

(ACTUAL SIZE)

HELIOTYPE CO., BOSTON.

people the manufacture of clay pipes was, no doubt, practiced pari passu with that of vase making, but it seems in many ways to have been a distinct and independent art. Pipes were not made of the same varieties of clay, or by the same hands, as were the vases. In all probability clay pipes were the work of men, as were the pipes of stone, while vessel making was the work of women. That pipe making was contemporaneous with vase making is shown by the repetition in pipe bowls of the form and decoration of vases, but it is apparent that the former art continued long after the cessation of the potter's art proper, extending down nearly or quite to Revolutionary times in the North, and down to the present day in the South among the Cherokees. In support of the theory of the later use of pipes of native make may be cited the fact that pipes are especially plentiful on the more recent town sites of the New York Indians. Metal pots were supplied plentifully by the earliest traders and colonists, but as smoking and pipe making were indigenous to America, it was probably many years before the intruders engaged actively in pipe manufacture. It is well known, however, that tobacco pipes of European make formed an important article of trade in colonial times, and we can not assume in all cases to distinguish the foreign from the native work.

DISTRIBUTION

Earthen vessels were made and used by women, and were little subject to transportation beyond the permanent settlements, but pipes belonged to the men, and were carried habitually about the person, thus reaching the farthest limits of the expeditions and forays of the people. They were also readily made on short notice at any point where clay could be secured. Since they were used in councils with neighboring peoples they were thus subject to still wider distribution by friendly or ceremonial exchange. It is observed, however, that the pipes of outlying communities are not wholly typical. The pipes of Romney, West Virginia, and Bainbridge, on the Lower Susquehanna, resemble somewhat the South Algonquian pipes, and those of the Lake Huron region vary equally from the types. This is the result, no doubt, of contact with neighboring peoples and the influence of their art forms.

MATERIAL, COLOR, AND FORM

In the manufacture of pipes by the Iroquois, fine clay, pure or mixed with very finely comminuted tempering ingredients, was used. Pulverized shell was used at times on the outskirts of the province.

So far as has been observed, the pipes have not been colored artificially. The varied hues of light and dark yellowish, reddish, and

brownish grays, the latter sometimes approaching black, are the result of baking, use, accident, or conditions of burial.

The simplest pipe form is a straight tube, with large enough opening at one end to receive the necessary bits of tobacco, and a passage small enough to permit the drawing of smoke without admitting particles of the ashes or leaf. The original forms must have varied with the diverse models at hand, and, if we take the whole country into account, there is considerable diversity in form, size, and material. Pipes of stone are much more varied in shape than are pipes of clay. The clay pipe of the East and North is based on the plain tube, the prevailing modification being the development of the bowl and the addition of a trumpet-like mouth. The tube is not straight, but is bent at the base of the bowl at angles varying from a few degrees to a right angle or even more.

The bowl was subject to varied and often extraordinary modification of form. The stem, as a rule, remained a plain tube straight or slightly incurved, often of uniform thickness save at the tip, or swelling gradually toward the elbow or curve. Very often the bowl did not begin to expand decidedly at the bend but beyond it, sometimes at the very rim, while in cases the expansion was gradual, the mouth being encircled by an inconspicuous band. In cases the lip was somewhat constricted. Description must fail to convey a clear and full notion of the varied modifications of this trumpet-shaped pipe, and four plates are introduced to serve this purpose. The bowl was the subject of much fanciful modification by the application of life forms, quadrupeds, birds, and men being freely employed. Occasionally the full figure of a man was represented, the feet forming the mouthpiece and the bowl opening in the top of the head. In cases animal forms were similarly treated, and serpents were made to coil about the full length of the tube. Generally, however, the upper part of the figure, the head alone, or certain features only were embodied in the bowl. Sometimes two creatures, or parts of two creatures, were affixed to one pipe, and a few specimens have been collected in which a number of heads or faces have been combined or knotted together in a grotesque cluster covering the whole exterior of the pipe. In very many cases a wolf-like head is modeled so that the mouth forms the bowl, the muzzle of the creature pointing upward. Generally when the head is placed on one side of the rim it faces the smoker, but pipes have been observed in which it looks to one side, or from the smoker. In one case a small face is modeled on the inner surface of the divided lip of the bowl. I have been able to recognize with reasonable certainty, besides faces of men, the features of the bear, wolf or dog, owl, eagle or hawk, crow or raven, and snake. Grotesque figures, combining features of men and animals, are rare, but fancy was likely to take almost any direction with these versatile potters.

great care with a pointed or notched tool, the form of which can not be determined.

The state of New York has furnished many examples of ware of the general type illustrated above, but, as a rule, it is in a fragmentary state. It is hardly necessary to present additional examples, save in two cases. The remarkable vessel shown in plate CXLVII *b* was obtained by Dr D. S. Kellogg in Plattsburg, New York. It is 11 inches in height, and is apparently very well made. The shape, which is especially notable, and the peculiar ornamentation take it out of the ordinary Iroquoian group and place it with the wares of the upper Mississippi valley. It has a long, conic body, slightly constricted neck, and simple expanding rim. The entire surface is decorated with roulette markings. A minutely notched wheel was used on the neck, and apparently a distinct and more coarsely notched wheel or tool was used on the body. This vessel is decidedly an exotic in the region.

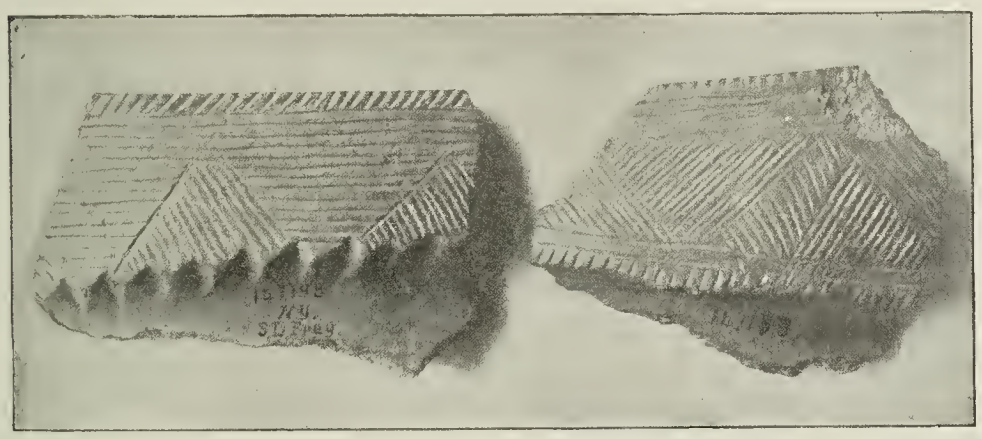


Fig. 63—Fragments of decorated vase-rims from the Mohawk valley.

Two fragments of the very neat and quite typical ware of the Mohawk district are represented in figure 63. They belong to a small series of like sherds presented to the National Museum by Mr S. L. Frey. Reverend William M. Beauchamp, of Baldwinsville, New York, has made careful examinations of the earthenware of the state and has acquired an extensive series of drawings, some of which have been placed at my disposal. It is expected that Mr. Beauchamp will in the near future publish detailed studies on this and other branches of Iroquoian art.

EXAMPLES FROM NEW ENGLAND

Historically and traditionally we learn that the Iroquoian tribes occupied or overran the greater part of the New England province. They are known to have visited the Atlantic coast at many points between New Jersey and Maine, and, according to Leclercq, the Gaspeian Indians of St Lawrence gulf were three times defeated or "destroyed" by this bold and enterprising people. The Abnakis of

Maine, in a treaty with the whites, claimed the land as far westward as the Connecticut river, which they spoke of as the ancient boundary between their people and the Iroquois.[a] It is therefore to be expected that now and then remains or relics of the latter people will be found scattered over the New England states.

A number of earthen vessels approaching the Iroquoian type were recovered by Professor Putnam from a grave in Winthrop, Massachusetts (plate CLX). They were accompanied by articles of European manufacture, leaving no doubt that pottery was in use after the coming of the whites. During early colonial times this region was occupied by Algonquian tribes, and, though the Iroquois are known to have visited the vicinity of Boston bay, the question may be raised as to whether this variety of ware was not, in this section, common to the two stocks of people. Its presence here is perhaps more reasonably accounted for by supposing that the Algonquians were subject to Iroquois influence, possibly obtaining the art of working clay from them. The larger piece (*c*) has the pronounced overhanging collar, embellished with a frieze of incised lines grouped in usual ways, the shoulder being encircled by a line of indentations. The small cup (*b*) is typically Algonquian, while the fragment (*a*) presents Iroquoian characters repeated in vases from Ipswich, part of which were obtained by Professor Baird from shell banks. Good specimens of the same variety of ware are preserved in the museums at Salem, and an interesting specimen, belonging to the same subgroup, was found by Professor Wyman in a grave at Hingham, Massachusetts. A rudely incised twined meander is the most remarkable feature of this vessel; it is the only example of its class, so far as my observation extends, found in New England. The treatment of the rim and the lower margin of the frieze, as well as the pointed base, is Iroquoian rather than Algonquian. In an interesting review of the antiquities of Connecticut, Mr James Shepherd illustrates a fragmentary vase from that state.[b] The restoration is possibly somewhat inaccurate as to outline, for, judging by the many other specimens of its class, the body should be much longer and the base somewhat more conic. The form as restored is not so much Iroquoian as Algonquian save in its rolled rim, but the zone of incised ornament is apparently Iroquoian.

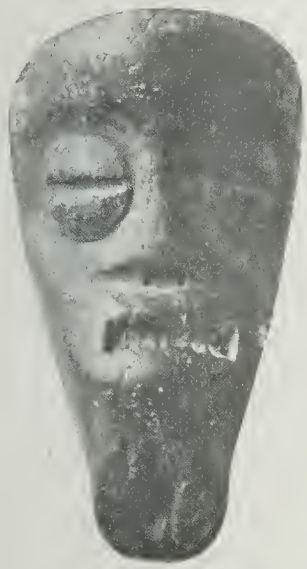
The discovery of typical Iroquoian ware in the region of Lakes George and Champlain is to be expected, for the dominion of the eastern tribes of that stock certainly extended over much of this country at one time or other. The collections and writings of Professor George H. Perkins, of Burlington, bear ample testimony to this.[c]

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[a] Vaudreuil, Marquis de, letter of April 21, 1725, in Doc. Col. Hist. of New York, Albany, 1855, vol. LX, p. 943.

[b] Shepherd, James, New England Magazine, December, 1893.

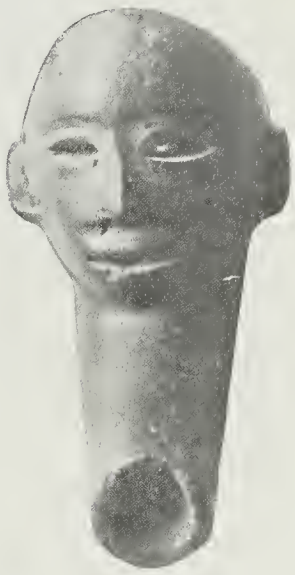
[c] Perkins, George H., The calumet in the Champlain valley, in Pop. Sci. Monthly, New York, 1893, vol. XLIV, p. 238; some relics of the Indians of Vermont, in Amer. Nat., Salem, 1871, vol. V, p 14; on some fragments of pottery from Vermont, in Proc. Am. Ass. Adv. Sci., 1877, p. 325.



a (ACTUAL SIZE)



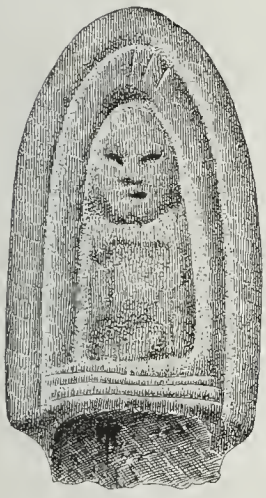
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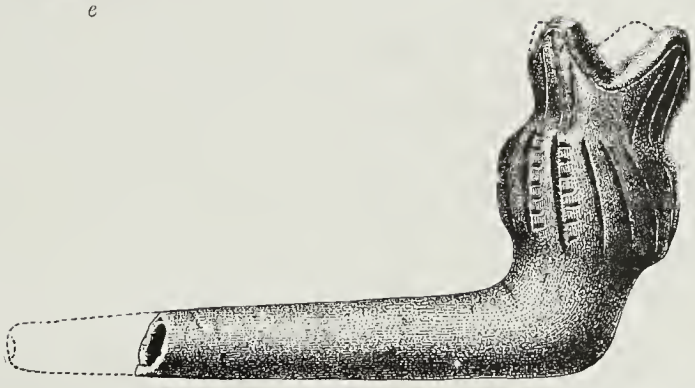
c (ACTUAL SIZE)



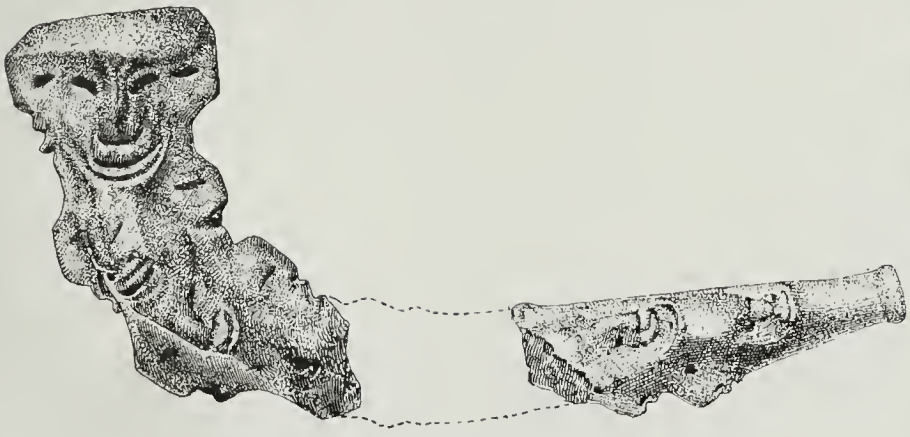
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f (LENGTH 4 INCHES)



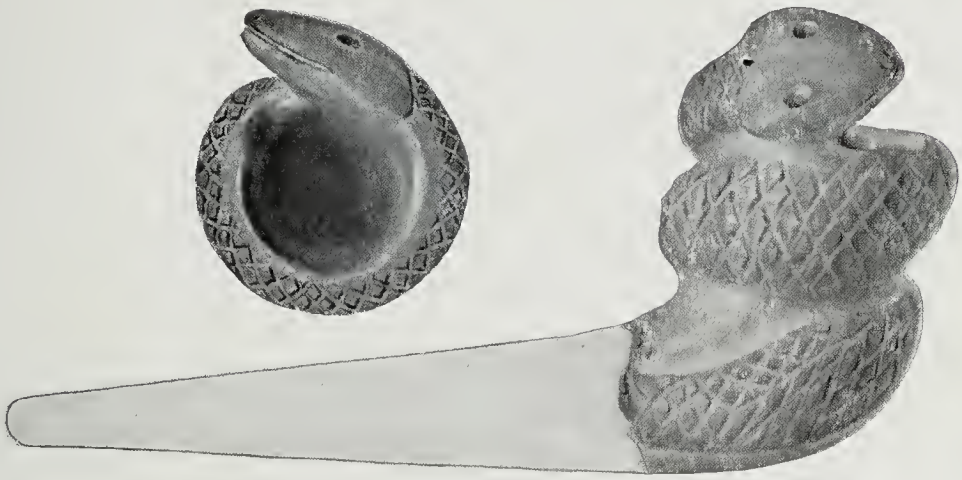
g (LENGTH ABOUT 8 INCHES)



h

EARTHENWARE PIPES

IROQUOIAN GROUP



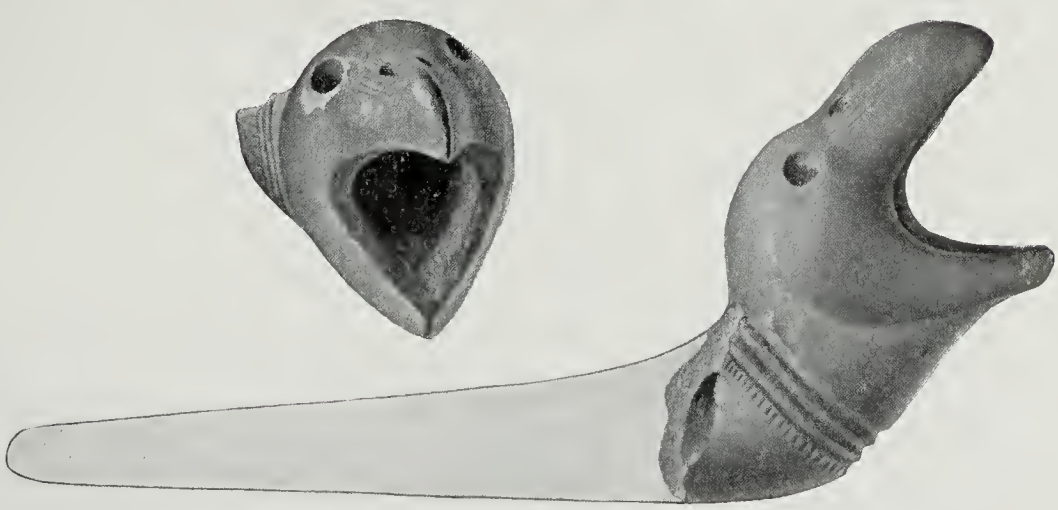
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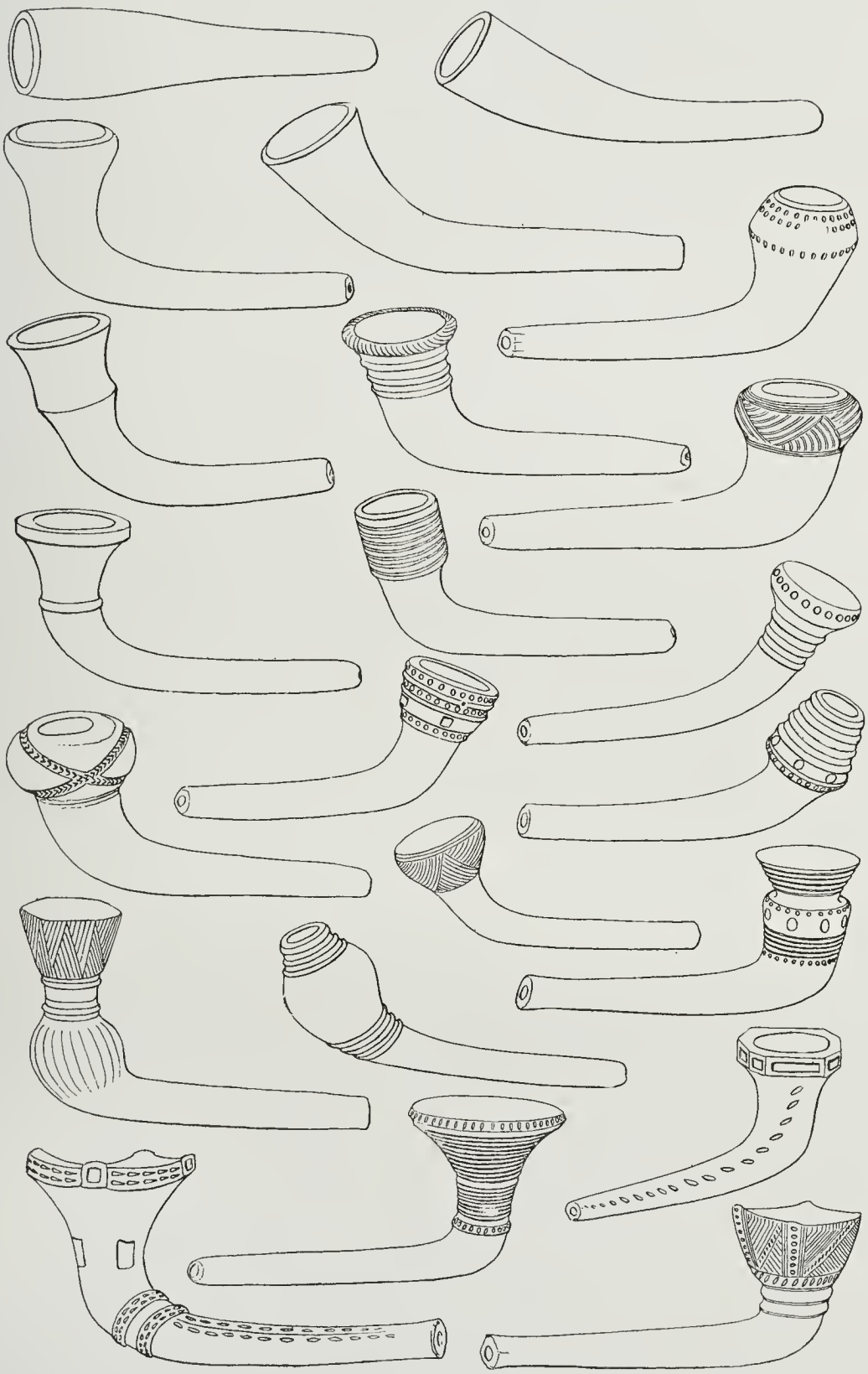


d

EARTHENWARE PIPES

IROQUOIAN GROUP

(THREE-FOURTHS)



EARTHENWARE PIPES

IROQUOIAN GROUP



EARTHENWARE PIPES

IROQUOIAN GROUP

In order that a fuller notion may be conveyed of the artistic ability of the pipe makers, and their plastic treatment of men and other creatures, a number of pieces are assembled in plates CLIV, CLV, CLVI, and CLVII.

POTTERY OF THE NEW JERSEY–NEW ENGLAND PROVINCE

General Characters

The pottery of the coastal districts throughout the middle and northern Atlantic states is uniformly archaic in its shapes and elementary in its decoration. Entire specimens are rarely found, as the custom of burying vases with the dead was not so generally practiced here as elsewhere, and the fragile culinary utensils found on the midden sites are always fragmentary. Sherds have been collected all along the coast and on the bays and tidewater rivers from the Chesapeake to Nova Scotia. They abound on countless ancient sites, and are especially plentiful in the shell deposits which line the shores. These wares are to a large extent Algonquian in type, although there is more or less blending with the Iroquoian wares of the interior districts along the fall line[a] and beyond in Pennsylvania and New Jersey, and somewhat nearer the ocean in New York and the New England states. The materials are, as in the Chesapeake country, clays of no great purity, intermingled with much coarse siliceous tempering and, rather exceptionally, with pulverized shells and other substances. The paste is hard and is moderately tenacious where well preserved, but it crumbles rapidly when decay once sets in. The fracture is rough and uneven, and the colors are the usual brownish and reddish grays.

Manufacture was confined almost exclusively to vases and pipes; the former are simple utensils, and the latter are the small, bent trumpet tubes common to the Algonquian areas. In shape the vessels are extremely limited in range, extending to no other forms than those included between a deep cup or bowl and a wide-mouthed pot. Vessels of the latter variety were rarely more than 10 or 12 inches in diameter or in depth. The rims were usually carelessly rounded or squared off, and were seldom much thickened. Exceptionally they were supplied with exterior bands, which in New England expanded into a rounded frieze, resembling closely that of the Iroquoian ware. The rims were also occasionally scalloped, as in the Chesapeake country and in New York. The neck was never greatly constricted, the body swelled but little, and the base was often, especially in the New Jersey region, considerably lengthened below, and was decidedly pointed. Generally the walls were thin and the surfaces

[a] The term "fall line" is applied to the rather abrupt line of descent that occurs where the upland joins the lower tidewater districts. It passes through New York, Trenton, Philadelphia, Washington, and Richmond.

roughly finished. The polishing tool was used only to give sufficient finish to enable the decorator effectively to use his stylus or roulette. Details of decoration and finish may better be given when the varieties of ware are presented. The presence here and there of peculiar and apparently exotic types of decoration is quite puzzling; for example, in Maine and New Jersey are encountered occasional examples of rouletting exactly duplicating the style so common on the upper Mississippi. The peoples probably belonged to the same stock, however, and it is not at all improbable that migrations took place between these widely separated regions. The reticulated stamp, characteristic of Florida, appears now and then in Pennsylvania and New Jersey.

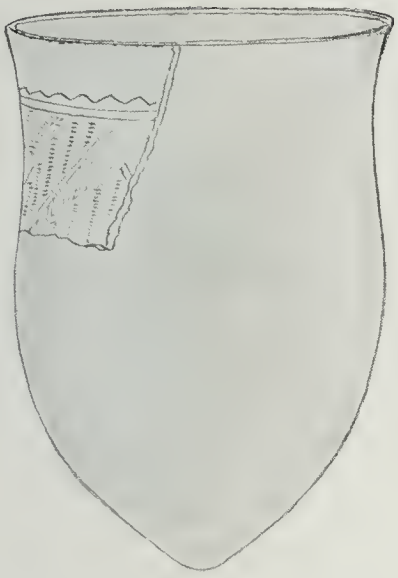
No attempt will be made in this place to cover the coastal districts in detail, and attention will be confined to a few localities chosen to represent the ceramic remains of the Northeast. The area considered in this section is included, in a general way, on the map, plate IV, accompanying a preceding section.

The Delaware valley is separated from that of the Susquehanna and Chesapeake by only a few miles of lowland, and it is not surprising that the forms of ware found on the village sites of the districts duplicate one another very closely. There is apparently no decided break in the characteristics of the art from Norfolk to New York bay.

Delaware Valley Ware

By far the most prolific of the pottery-producing sites in the Delaware valley is that on Pocatquissing creek, 3 miles south of Trenton, so thoroughly explored by Mr Ernest Volk for the Columbian Exposition. Here was found the largest, the best preserved, and the most highly elaborated pottery yet collected on the coast north of the Savannah river. Its relationship with the Algonquian wares of the Chesapeake and Yadkin is, however, very close, and is especially so in several minute details of form, elaboration, and decoration, thus enforcing the idea that the peoples were the same, or were very intimately related or associated. The forms and ornaments are somewhat more elaborate and graceful than those in the Chesapeake ware, and in some features it differs decidedly from that ware. Among these features of unlikeness may be mentioned the occasional much elongation of the bodies, the decided squaring off of the rim, the use of the roulette in decoration, and the addition of a line of indentations encircling the body low down and separated entirely from the main zone of embellishment about the neck.

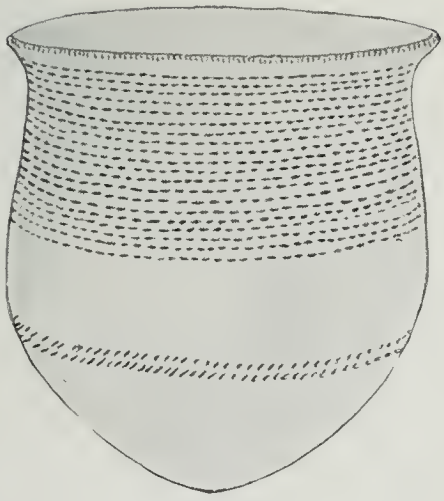
Characteristic examples of the better ware of this locality are given in plate CLVIII. Large fragments appear in *a* and *b*, and the general shape is indicated in *c*. The diameter is 12 inches, and the height was probably a little more than this. The finish is excellent. The rim is flattened above and indented. The general surface is smooth, and



c (DIAMETER 12 (?) INCHES)



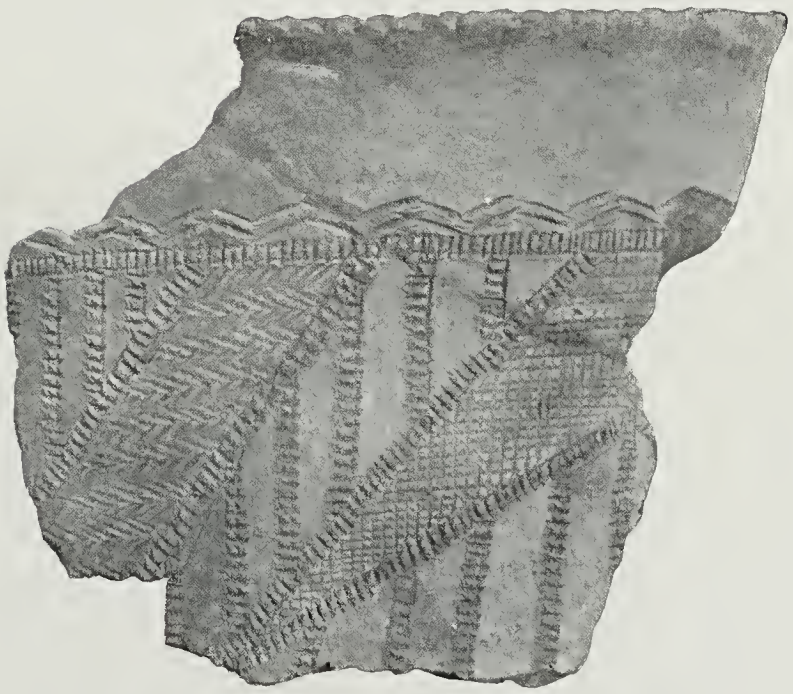
d (HEIGHT 5 (?) INCHES)



e (DIAMETER 8 INCHES)



a



b

POTTERY FROM A VILLAGE SITE NEAR TRENTON, NEW JERSEY

NEW ENGLAND GROUP

the patterns, executed with a sharp point, are elaborate and unusually neat. The figures which cover the upper part of the body have little symmetry or continuity, a characteristic of Algonquian work, and consist of spaces and bands filled with simple lines, reticulated lines, and herring-bone patterns bordered by plain and zigzag lines. The prevailing outline of these vessels is given in *c*.

A smaller vessel, nearly complete, though broken, is illustrated in *d*, plate CLVIII. It does not differ in any essential from the preceding, but is smaller and much simpler in treatment, and its profile shows a decided angle separating the upper and lower slopes of the body. The stylus has been used from the inside of the margin to punch out a series of nodes about the exterior of the rim, and an isolated line of indents appears far down toward the conic base.

An additional example is presented in plate CLIX *a*, the outline restored appearing in *e* of the preceding plate. The diameter approaches 10 inches, and the height must have been a little more than that. The rim is turned sharply outward and minutely notched on the outer edge, the neck has been very slightly constricted, and, as in many better preserved specimens, the base was probably sharply conic. The paste is silicious, moderately fine grained, and yellowish gray in color. The surface is smooth, but without polish. The decoration consists of 22 lines of roulette markings, imitating coarse cord imprints, encircling the upper part of the body. A double line of like markings encircles the body quite low down.

The largest vessel of which any considerable fragments were recovered was originally about 25 inches in diameter and nearly the same in height. The surface was finished first with a net-covered tool, the meshes of the fabric being over half an inch in width. The upper part of the body was smoothed sufficiently for the addition of incised figures, but not so fully as entirely to destroy the deeper net impressions, and on the lower part and base the imprint is perfectly preserved. The rim is three-fourths of an inch thick, flattened, and sloped inward above, and is decorated, as in many other cases, with cord or stylus imprints. The use of the net and the manner of rubbing down the impressions more or less carefully, according to the needs of the decorator, are identical with corresponding features of the Chesapeake and Carolina net-marked wares. So closely do some of these specimens resemble those of Popes creek, Maryland, and Yadkin river, North Carolina, that the reader may be referred to plates CXXX and CXXXVII for details of shape and ornament.

A village site at Point Pleasant, on the Delaware, 25 miles above Trenton, has furnished numerous specimens of earthenware. It is a notable fact that some of the fragments gathered by Mr H. C. Mercer from the surface or from exposures made by floods are of a stamped ware, resembling very closely the checker-stamp varieties so

characteristic of Florida, Georgia, and parts of the Carolinas. It would seem that, if no mistake has been made in the identity of the sherds, colonists or visitors from the far south must have dwelt on the site long enough to engage in the practice of the potter's art.

Aside from these specimens, all the varieties of ware observed correspond very closely with those of the Trenton sites and with the typical tidewater Algonquian forms of the lower Delaware and Chesapeake regions. Higher up the Delaware we encounter vessels approaching the Iroquoian type, and finally, in the upper valleys, the ordinary Iroquoian wares prevail. It is stated by Mr Ernest Volk, and confirmed by Mr Mercer, that there were two successive occupations of some of the Delaware valley sites, and it is surmised from various reasons, one of which is the scarcity of pottery at the lower level, that a considerable period elapsed between the first and second occupations; but as these villages were situated on land subject to inundation, the change from the lower to the higher level may have been brought about in a single season. The greater number of relics in the upper deposits may have been due to longer occupation or to more thorough protection from floods. If there are pronounced differences in art, methods of burial, materials used, etc., it is quite as reasonable to suppose that the peoples changed as it is to assume that a period of such duration passed between the successive occupations that decided advances in culture status were made. It is a significant fact that, though there is less earthenware in the lower than in the upper deposits, there is no perceptible difference in the make. There appears, therefore, to be no sufficient reason for supposing that the earlier occupation of the valley, as shadowed forth in these remains, extends far back toward glacial times, or that the people in either case were other than the Algonquian inhabitants found in the Delaware valley by William Penn.

New England Ware

The ware of the region of New York bay, Long island, Connecticut, and Rhode Island indicates a closer affiliation of the makers with the Iroquoian potters than existed between the latter and the more southern Algonquians. A good illustration of the ware of the New York region is given in plate CLIX *b*. A similar specimen, found at Farmington, Connecticut, is illustrated in an article on Connecticut archeology by James Shepherd, published in the New England Magazine, 1893. If we judge by the examples of this ware known to me, the restoration given by Mr Shepherd makes the vessel too short in the body and without the usual conic tendency of the base. The indented designs in these specimens resemble a prevailing Iroquoian treatment.

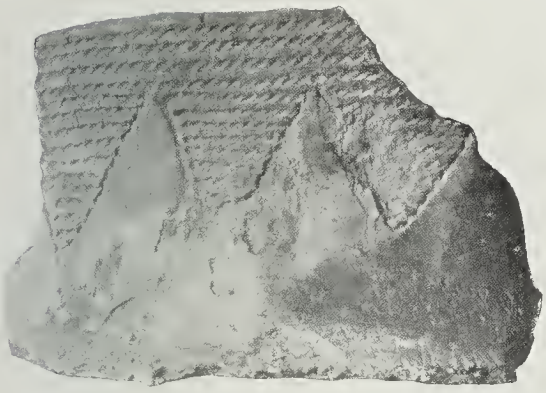
The same ware is found throughout Massachusetts, and I have had



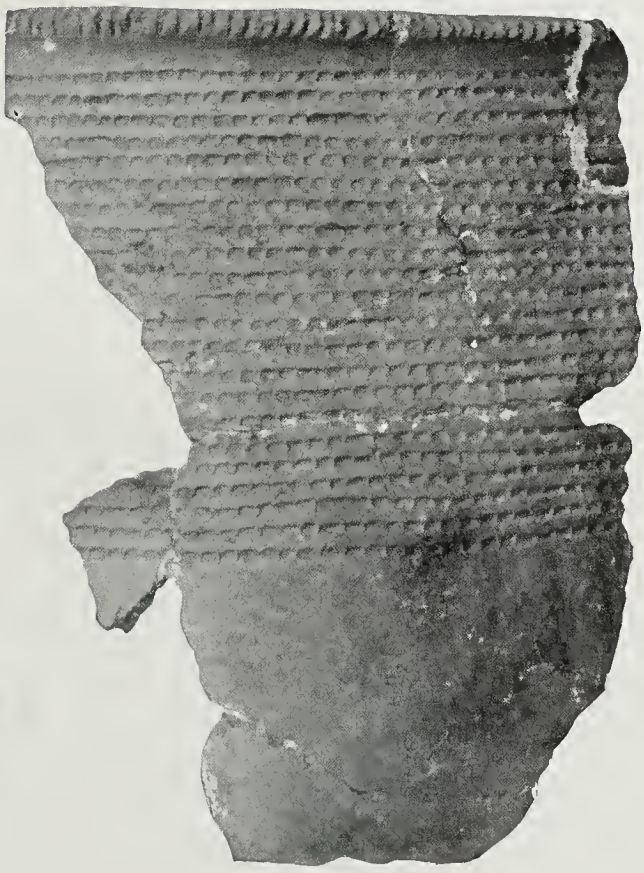
c



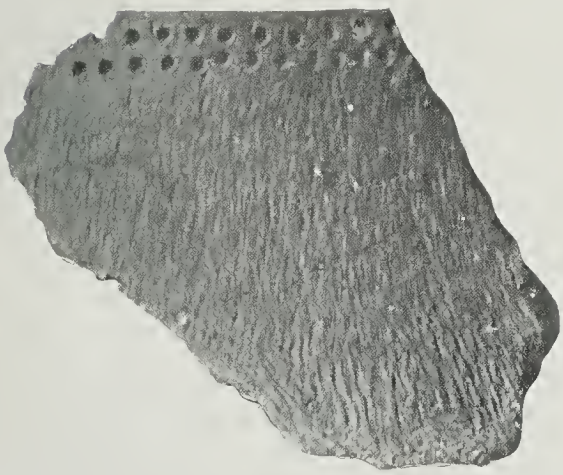
b



d



a



e

POTTERY FROM THE ATLANTIC COAST STATES

NEW ENGLAND GROUP



a



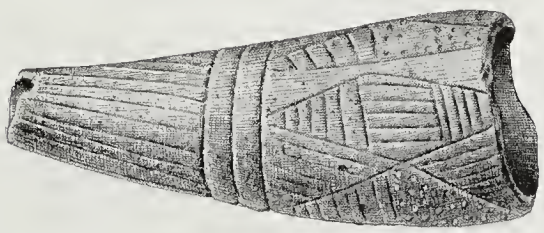
b



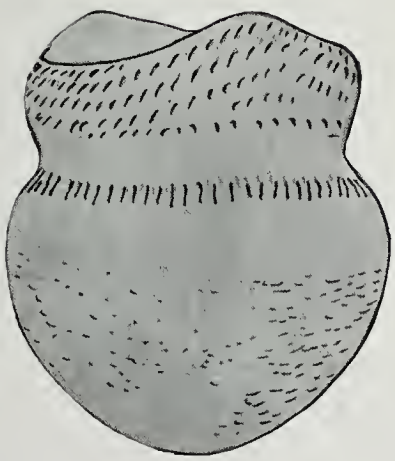
c



e (HEIGHT ABOUT 5 INCHES)



g (LENGTH 3 INCHES)



f (HEIGHT ABOUT 6 INCHES)



d (HEIGHT 4 INCHES)

POTTERY FROM NEW ENGLAND

NEW ENGLAND GROUP

the good fortune to find fragments of a small vase on the island of Nantucket.

The pottery of eastern Massachusetts is represented by a considerable number of pieces, some of which are entire, or nearly so. That the Algonquian tribes were making and using pottery on the arrival of the whites is made certain by numerous references to the subject in early writings. Thomas Morton, in Force's Tracts, volume II, page 30, says that "they have earthen potts of divers sizes from a quarter to a gallon, 2. or 3. to boyle their vitels in; very stronge, though they be thin like our iron potts." It seems, therefore, that notwithstanding the presence of apparently Iroquoian features in these vessels, we are warranted in attributing them to the historic Algonquians, since all the specimens are much alike in every essential respect.

The figures given in plate CLX will convey a good idea of the characteristics of this ware. Specimens *a*, *b*, and *c* were obtained by Professor F. W. Putnam from graves in Winthrop, Massachusetts. With them were associated glass beads, so that the date of their manufacture is probably somewhere between 1620 and 1650. The height of the larger vessel is about seven inches, and the others are shown on the same scale. Specimen *d* is from Hingham, Massachusetts, and the others given in outline are sketch restorations of small vessels recovered from a grave at Revere (*e*), and from a grave at Marblehead (*f*). In nearly all cases the surface has been worked down with textile-surfaced tools, and subsequently portions about the rim and neck have been rubbed down and rudely decorated with incised lines and indentations. The pipe *g* was found in Connecticut, and is decorated in a style corresponding closely to that of the Algonquian vases.

The village sites and shell banks of Maine yield considerable pottery of the simple styles common in the Algonquian areas. It is found in fragments, and but few specimens even of these have found their way to the museums. The vessels were mere pots, and the pipes, although sometimes ornamented with incised lines and indentations, are mainly the simple bent trumpet of the more southern areas. The clay is tempered usually with a large percentage of coarse sand, the finish is comparatively rude, and the ornament, though varied, is always elementary. The surfaces have, in many cases, been textured with cord-covered paddles, and over these, or on spaces smoothed down for the purpose, are various crude patterns made with cords, bits of fabric, roulettes, and pointed tools of many varieties. The use of the roulette would seem to link the art of this Abnaki region very closely with that of the Middle Atlantic states and portions of the upper Mississippi region. The simple notched roulette was used in the manner shown in plate CLIX *c*, and the compound roulette was quite common.

Prolific sites are found on the Kennebec and Penobscot rivers, and all along the shellfish-producing shore as far as Nova Scotia.

POTTERY OF THE APPALACHEE–OHIO PROVINCE

The pottery of a large area lying between the Appalachian ranges and the Ohio river is difficult of characterization. The ceramic conditions in certain parts are apparently such as might result from an intermingling of the work of peoples from the North, West, South, and East, while in other sections the ware of a single style prevails. Collections have not been made with sufficient care to enable us to say what is the nature of the association of the different exotic forms and features with products of more strictly local development. In many localities in East Tennessee we find together specimens of the stamped ware of the South Appalachian district, the polished bowls, pots, and bottles of the Mississippi region, vessels that resemble quite closely the ware of the valley of the Ohio on the north, and others almost identical with those of the Gulf province on the south.

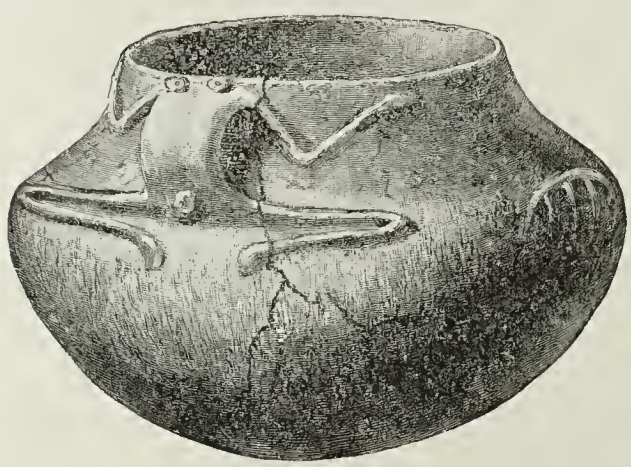


FIG. 66—Vessel with animal-shaped handles, from a mound on Fains island, Jefferson county, Tennessee.

The stamped ware of the East Tennessee district does not always repeat the forms and patterns of the South Appalachian region with accuracy, but exhibits, in cases, decided individuality. In like manner pottery of western appearance is not typical of the West, but has a local flavor. The high-necked bottles, the humpback figures, the grotesque animal forms, and the red and white painted decoration are apparently wanting.

From mounds, graves, and dwelling sites over a large part of the province we have examples of a variety of ware, mostly shell-tempered, and consisting largely of culinary vessels, the strongest characteristic of which is the looped handles connecting the rim with the neck or shoulder. These handles are of many styles and vary in number from two to eight to a vessel. They are sometimes elaborated into animal figures, as is seen in figure 66, but generally they are less carefully worked out than in the West. Besides the two animal-shaped loops, placed on opposite sides of the rim of this vase, there are alternating comb-like ornaments, which probably represent some animal feature, set on the shoulder of the vessel. It is possible they stand for the hand or for a wing, and may thus be a conventionalized form of animal symbol common in the Central Southern states. This piece

illustrates a prevailing form of culinary vessel, and exhibits the peculiar finish of the body produced by malleating with textile-covered modeling tools. A unique form of handle is shown in figure 67. This piece is not unusual in any other respect.



FIG. 67—Vessel with arched handle, from a mound in Sevier county, Tennessee.

A small vessel of very unusual shape for eastern America is shown in figure 68. It exhibits the usual crude manipulation of the region, and is tempered with coarse shell. It is in every respect characteristic of the district, save in the prolongation of one side of the body into a rounded point, giving what may be likened to a shoe shape, but which also, as seen in profile, suggests the form of a bird. The two handles are placed as usual; one is normal, but the other extends out on the projecting lobe and is continued in three spreading notched fillets which connect with a notched band carried around the shoulder of the vessel.

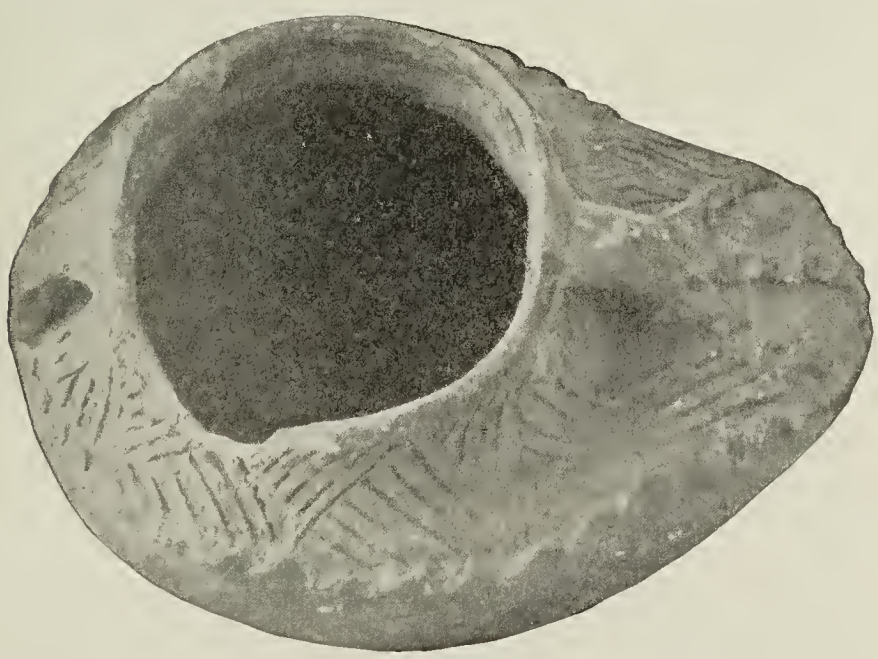


FIG. 68—Shoe-shaped vessel, with incised designs, Loudon county, Tennessee.

The neck and shoulder are embellished with a pattern of incised lines rranged in alternating triangular groups. A similar vessel from n adjoining county is shown in figure 69. Especial attention is

called to these vessels by the fact that they are the only examples so far added to our collections from the eastern half of the United States exhibiting the peculiar shoe shape so frequently appearing in the Pueblo country, and again as a prominent feature in the ware of Central America. There can be no doubt that the shape and the plastic elaborations are significant and symbolic, but the exact nature of their symbolism and the explanation of their isolated occurrence are not yet forthcoming.



FIG. 69—Shoe-shaped vessel, Monroe county, Tennessee.

A small cup with three rows of nodes encircling the body is presented in figure 70.

Ware of the general type to which the above specimens belong is found along the eastern slopes of the Appalachian mountains in North Carolina, Virginia, and West Virginia. It occurs along numerous streams entering the Ohio from the south, and probably passes gradually into the well-known ware of the Miami valley, where, at Madisonville, we have the most striking types of handled pots. It is unfortunate that we must pass so briefly over a great area that ought to furnish much material for the history of arts and peoples, but such meager collections have been made that we seem to have warrant for the theory that the absence of permanent residents, remarked of this region in early historic times, may have, in a measure, characterized the eastern portions of the "dark and bloody ground" from the very beginning of native art in clay.

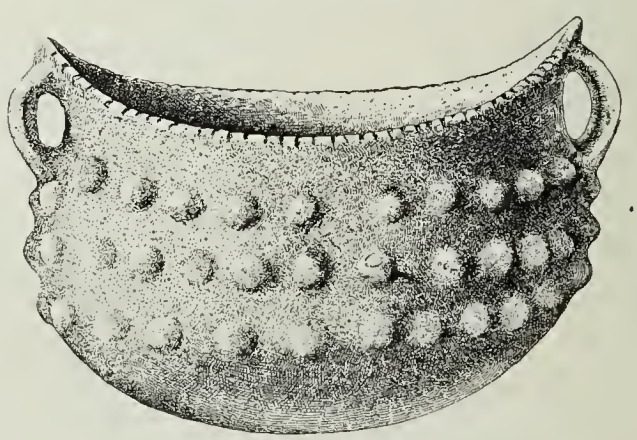


FIG. 70—Two-handled cup with rows of encircling nodes, Tennessee.

OHIO VALLEY POTTERY

CULTURE GROUPS

The art remains of the Ohio valley occupy an important place among the existing vestiges of our native races, and the relics of earthenware pertaining to the region, although generally simple and inartistic, are, from their associations, invested with exceptional interest.

The province is a vast one, having a width of from 200 to 400 miles and a length of nearly 800 miles. It is divided into numerous physiographic districts, more or less independent of one another, and furnishing boundless resources to peoples fortunate enough to occupy them. As a consequence, the ancient remains represent numerous important culture groups. The Allegheny river, heading far to the north in New York and Pennsylvania, was the home of the warlike Iroquois, and the region is strewn with the remains of their peculiar arts. The Monongahela drains part of the region occupied by the eastern Algonquians, and transiently by many hunter-tribes of other stocks, and it contains traces of their simple yet instructive handiwork. The main southern branches, heading along the Appalachian ranges, were overrun in their upper courses by the South Appalachian peoples, whose art has already been described; and in their lower courses they penetrated the very heart of the great culture province of the middle Mississippi valley. The northern tributaries drain a fertile region occupied in historical times by numerous tribes, mostly of Algonquian stock, but at earlier periods by tribes of mound builders whose affinities of blood are not yet fully made out.

I have already dealt briefly with the wares of the eastern and southern borders of this wonderful province, and have now only to review the pottery of the immediate valley of the river and its extensions to the north and west. The study of the pottery of this latter region is invested with especial interest, for the reason that it may be expected to assist in elucidating the much-discussed problems of the mound builders and the relations of these peoples to neighboring tribes and to the Indians of historic times.

Opportunities for study have not been wholly satisfactory, as the collections made by numerous explorers are much scattered, and, at best, are not rich. It has been possible to distinguish only two groups of ware that differ so decidedly from the surrounding groups, and that possess such individuality, as to warrant the predication of distinct groups of people or phases of culture. It is worthy of special note that although they represent regions furnishing evidence, according to many authorities, of exceptional progress in art and in general culture, few of the examples of earthenware utensils rise above the level of the average ware of the eastern United States which is assignable to historic stocks. Indeed, it may be said that as a rule the ware belongs to the archaic northern grand division of the art rather than to the more highly developed product of the South. A number of small terra-cotta figures found by Professor Putnam in one of the Turner mounds near Cincinnati[a], and referred to briefly in his report, seem to be an exception. The figures are said to be remarkably well modeled and wholly unique.

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[a] Reports of the Peabody Museum, vol. III, p. 173.

Professor Putnam's reference to these objects is as follows:

> On another altar, in another mound of the group, were several terra-cotta figurines of a character heretofore unknown from the mounds. Unfortunately these objects, as well as others found on the altars, had been more or less burned, and many of them appear to have been purposely broken before they were placed on the altars. Many pieces of these images have been united, and it is my hope that we shall succeed in nearly restoring some of them. Enough has already been made out to show their importance in the study of early American art. The peculiar method of wearing the hair, the singular headdresses and large button-like ear ornaments shown by these human figures are of particular interest. The ear ornaments leave no doubt of the character of the spool-shaped objects referred to on a previous page.[a]

Occasional specimens of Middle Mississippi Valley type are found in Ohio, but I am not able to reach any conclusion as to the relation of the people concerned in their manufacture to the tribes referred to in the preceding paragraphs. Two excellent examples of this class are shown in plate CLXI. They come from a mound in Ross county, and are now preserved in the Ohio State Museum.

Miami Valley Ware

The pottery to be considered under this head does not include all the ware of the Miami district, but only that possessing characteristics peculiar to certain prominent sites located mainly on the Little Miami. This ware is not confined to the Miami region, for, as I have already indicated, it extends out with decreasing numbers of specimens and in less and less typical forms, even beyond the confines of the Ohio valley, especially into Kentucky and eastern Tennessee. The richest collections of the Miami wares are preserved in the Peabody Museum, and include a large series of well-preserved vases obtained from village sites in the vicinity of Madisonville. The Literary and Scientific Society of Madisonville made important finds in this region, and published descriptions and a number of illustrations.[b]

Some fine pieces obtained by Mr McBride, in Butler county, are preserved in the Museum of the Academy of Sciences in Philadelphia. Squire and Davis, in Ancient Monuments, figure 72, illustrate two vases of this class from near the surface of the ground in Butler county. From a village site at Fort Ancient, Warren county, Ohio, Mr W. K. Moorehead obtained numerous fragments of this pottery, illustrated in plate CLXII.[c]

The prevailing type of vessel is a round-bodied pot with wide mouth and flaring rim. Deep bowls are occasionally seen. The pots are strongly characterized by their handles, which connect the lip with the shoulder. As a rule these handles are thin bands, and lie close to

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[a] Putnam, F. W., Sixteenth and Seventeenth Annual Report of the Trustees of the Peabody Museum of American Archæology and Ethnology, vol. III, numbers 3 and 4, p. 173.

[b] Low, Charles F., Archæological Explorations near Madisonville, Ohio, Archæological Explorations by the Literary and Scientific Society of Madisonville, Ohio, 1878–80, parts 1, 2, 3, and 4.

[c] Moorehead, Warren K., Fort Ancient, Cincinnati, 1890, plate XXVII.



a (DIAMETER 3¾ INCHES)



b (DIAMETER 7⅛ INCHES)

VASES OF MIDDLE MISSISSIPPI TYPE

OHIO VALLEY GROUP

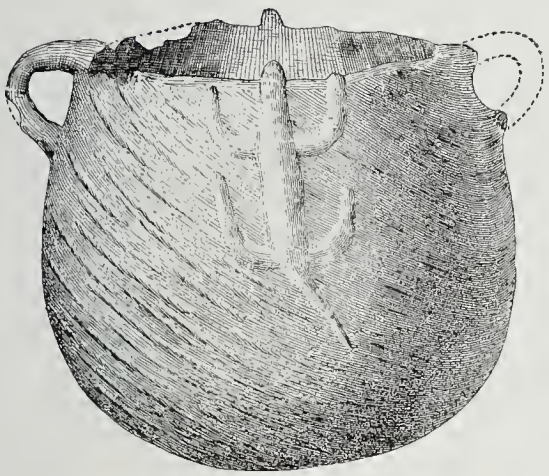
(OHIO STATE UNIVERSITY COLLECTION)



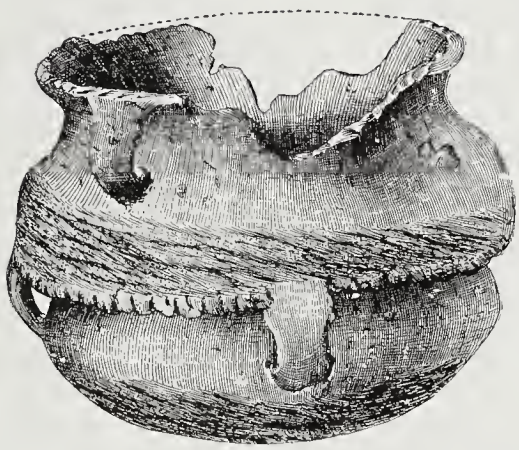
SHERDS WITH INCISED DECORATIONS FROM A VILLAGE SITE AT FORT ANCIENT

OHIO VALLEY GROUP

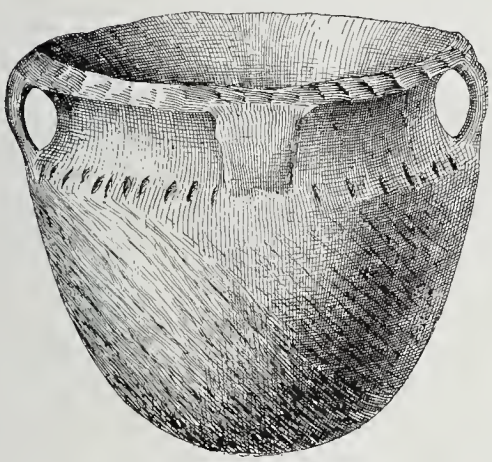
(MOOREHEAD COLLECTION, ABOUT THREE-FOURTHS)



a (HEIGHT 6 INCHES)



e (HEIGHT 3¾ INCHES)



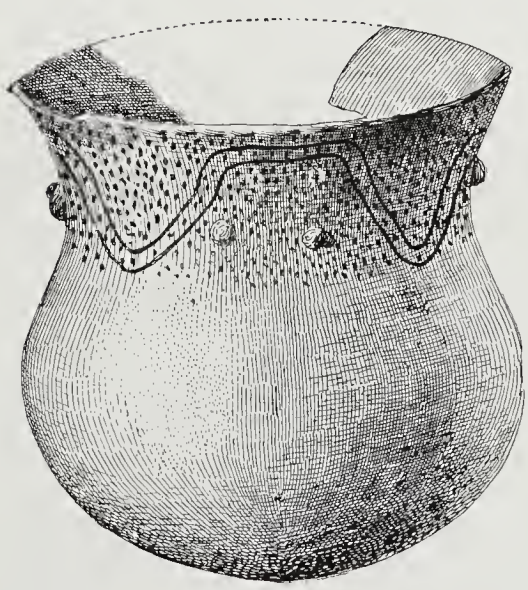
b (HEIGHT 4 INCHES)



c (HEIGHT 6¾ INCHES)



d (HEIGHT 10 INCHES)



f (HEIGHT 7¼ INCHES)

VASES FROM MOUNDS AT MADISONVILLE

OHIO VALLEY GROUP



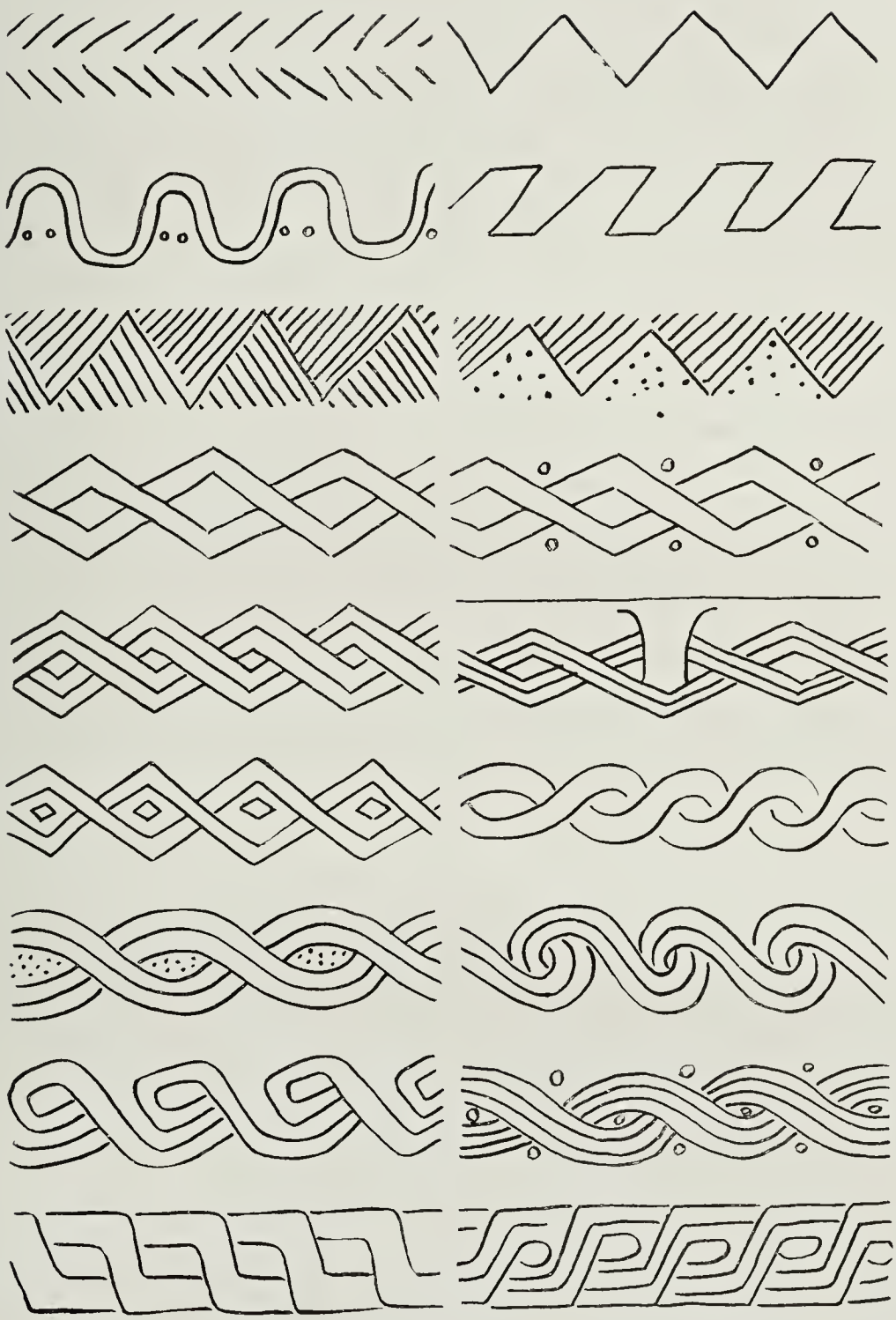
b (HEIGHT 4¼ INCHES)



a (HEIGHT 4¾ INCHES)

VASES ILLUSTRATING TEXTILE IMPRINTINGS

OHIO VALLEY GROUP



INCISED DECORATIONS FROM EARTHENWARE

OHIO VALLEY GROUP

the neck of the vessel. Their number is usually four, but two are sometimes seen, and occasionally there are more than four. In most cases they are wider where they join the rim, which is often drawn out to meet them. The outer surface of the handles is plain and flat in most cases, but examples occur in which it is concave, and in rather rare instances it is round. In no other section do handles form so important a feature of the ware as in southwestern Ohio. As a rule, in all sections, handles of this general type belong to vessels intended for culinary use, and it would appear from the signs of use over fire that many of the Miami vases were mere culinary utensils.

A number of specimens obtained from a mound near Madisonville, and referred to above, are shown in plate CLXIII. The first specimen, *a*, is supplied with two looped handles, alternating with which are two animal figures vertically placed. That the latter represent a quadruped is about all that can be said with safety, for they may have been intended for either a lizard or a mountain lion. In another case, a rudely modeled human head or face is attached to the upper margin of the rim. Nodes and low ridges take the place of handles in some specimens.

Examples of the average pot are given in *b* and *c*. Some peculiar modifications of the simple vessels are observed. One specimen, *d*, is mounted on a crudely made foot or stand; it has an awkward, top-heavy appearance. The addition of this feature was probably an experiment on the part of the potter, who was possibly attempting in a crude way to copy the work of his southern neighbors. A double vase from the same site is shown in *e*. There is no doubt that, as our collections are enlarged, additional forms will be added.

Plate CLXIV is introduced for the purpose of showing the peculiar surface finish observed in this ware. The modeling implement was a paddle or a cylinder wrapped with twisted cords, and applied to the plastic surface; it was generally held so that the markings are approximately vertical. These markings are obliterated on the neck of the vessels by finishing with the polishing stone.

Decoration proper is confined to the lip and neck. The lip is plain, rounded, squarish or uneven on the edge, or has a narrow collar or band on the exterior; this latter is often indented in a rude and simple manner, a herring-bone arrangement of short incisions being common. The constricted zone of the neck is generally rather rudely but effectively embellished with an encircling design, based on the meander, scroll or guilloche. A series of these figures is shown in plate CLXV, and the impression given is that the makers of this ware have in some way felt the influence of more southern culture, and have, in a crude way, introduced into their symbolism and decorative art a number of borrowed elements. In some cases, the current scroll, composed of neatly interlocked units, is clearly drawn, but as a

rule the lines form a somewhat disconnected guilloche, apparently the result of careless imitation of intertwined fillets. In some cases the figures are angular, and in a few instances they have been somewhat carefully elaborated with a modeling tool, giving a relieved effect.

This pottery does not take a high place among the various ceramic groups of the mound builders, and, if we should assume to determine the relative culture status of the various peoples concerned in pottery making from this art alone, we should find the Miami tribes near the bottom of the scale. Judging by the poverty of shapes, there had been but little differentiation of use. The introduction of life forms had hardly commenced, and the esthetic features were treated in a very elementary way, as if but recently introduced.

Salt Vessels

One of the most notable varieties of earthenware found in any of the regions is that represented by what are usually referred to as "salt vessels." Two localities in the Ohio valley are especially noted for this ware; one is near Shawneetown, Illinois, and the other is near Nashville, Tennessee. A rather full account of the ware has been given in the introductory pages, and I do not need to dwell on it here, save to say that it is my impression that these utensils do not represent a peculiar people or culture, but that they were produced by the various tribes of the region for the special purpose of reducing the salt waters of the localities in which they are found.

POTTERY OF THE NORTHWEST

Family Distinctions

In a paper published in the Fourth Annual Report of the Bureau of Ethnology the ancient ware of the valley of the Mississippi was discussed with some care, but the ground was not entirely covered. It was shown, however, that the pottery of the upper valley belongs to a family distinct from that of the lower, and that the limitations of its occurrence appear to mark, with some degree of approximation, the distribution of peculiar groups of people and of particular phases of culture. The general distinctions between the earthenware of the North and that of the South have been pointed out in the introductory pages and in the section treating of the eastern Algonquian areas, and it may be added here that the very poorly defined zone of transition crosses southern Ohio and extends across the middle portions of Indiana, Illinois, and Iowa. The southern ware extends considerably to the north of this zone in numerous cases, and the northern forms are found in decreasing numbers as we pass across it to the south. In some sections the typical wares of both provinces are found together

on one site. The correlations of either variety of ceramic products with groups of other classes of remains found in the same districts are not yet well made out.

In the West the contrasts between the ware of the North and that of South appear to be quite as pronounced as they are in the East. That of the South is highly differentiated and specialized; that of the North is pronouncedly archaic. That of the South exhibits variously tinted pastes, tempered principally with pulverized shells. The vases, as a rule, have full bodies, rounded bases, and, in very many cases, narrow and high necks. Animal forms are imitated with remarkable frequency and with much skill. The northern pottery shows a generally dark paste, tempered largely with coarse angular sand derived from pulverized rocks. The shapes are those of simple pots. The mouths are wide, the rims plain, and the necks but slightly constricted. Animal forms are rarely seen. The ornament of the South employs flowing as well as angular lines, varied colors, and a wide range of motives; that of the North is almost exclusively archaic, consisting of incised and indented geometric patterns. A comparison between the specimens brought together in the accompanying plates and those in the numerous plates of the Middle Mississippi section will prove instructive.

The pottery of the northern province is abundant, but is recovered for the most part in a fragmentary state. However, a sufficient number of well-preserved pieces have been collected to indicate pretty clearly the range of form and decoration.

This northwestern province includes the upper Mississippi valley, the Missouri valley, the region of the western Great lakes, and the valley of Red river of the North. The varieties of pottery are not confined to particular regions as decidedly as they are in the East. They may be classified for purposes of description under two heads, the rouletted and stamped ware and the cord-decorated ware, the latter including the work of the Mandans, the only tribe of the whole region known to have practiced the art in recent years.

This pottery occurs over large areas occupied in historic times mainly by the Algonquian and Siouan stocks. Much of it affiliates closely with the ware of the more eastern branches of the Algonquian, and, in some cases, in nearly all features of detail. One variety, however, shows decided affinities with the work of the South Appalachian potters. The Siouan peoples were probably potters in a limited way, especially where they were measurably sedentary in habits, and the same may be surmised of the Caddoan and other stocks. Mr A. J. Comfort, writing on this subject (Smithsonian Report for 1871, page 401), says that the Dakotas certainly practiced the art during the childhood of men still living. Dr J. Owen Dorsey, the well-known student of the Siouan tribes, informs me that Half-a-day, historian of the

Omahas, distinctly affirms that the art was practiced by his people as late as 1840, and the old lodge rings found on their village sites are well supplied with the usual cord-decorated and textured ware characteristic of the Missouri valley.

Rouletted and Stamped Ware

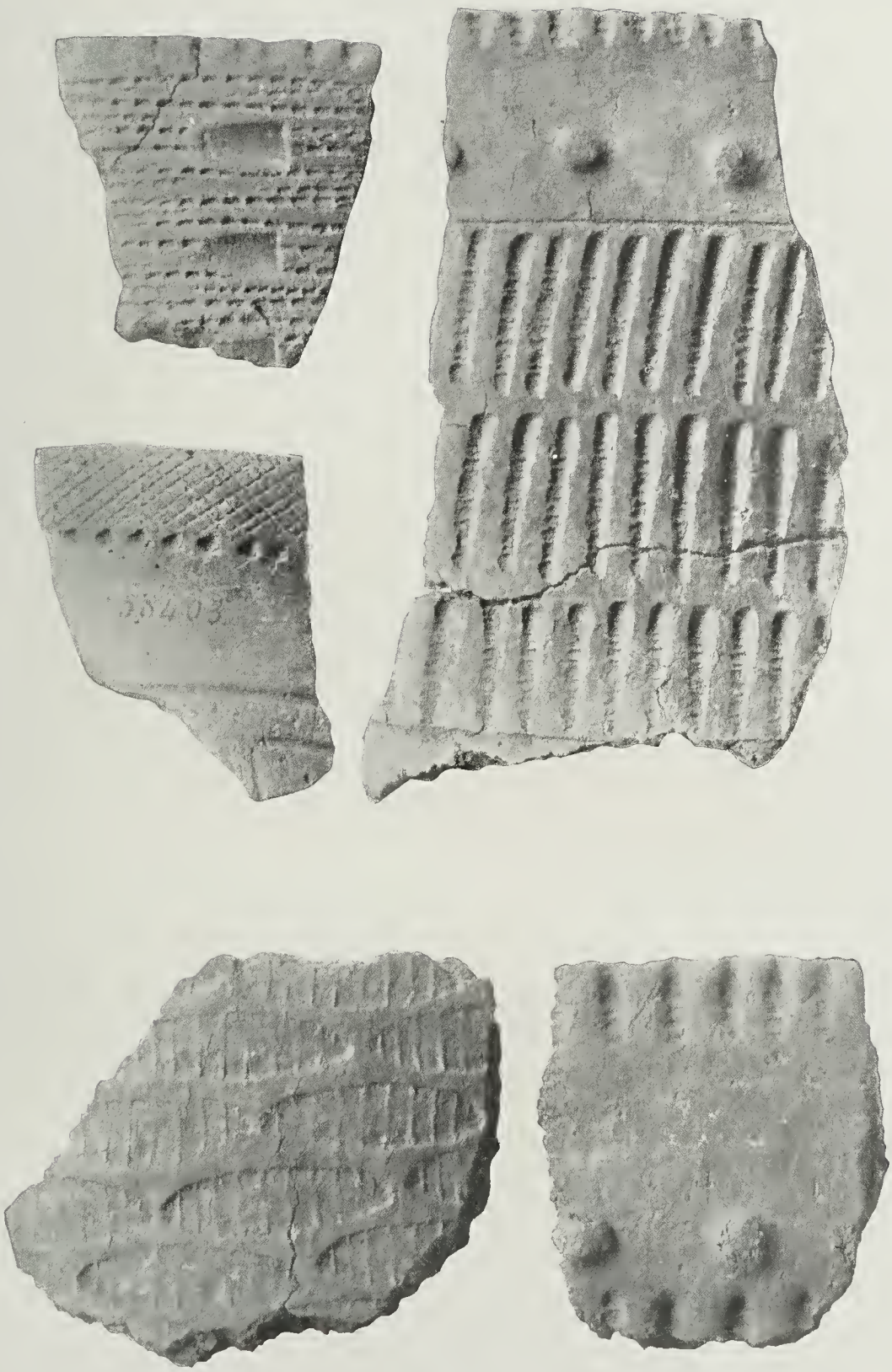
A large part of the ware of the Northwest may be brought together in a single group, which may be called, from its most pronounced technic peculiarity, the rouletted group, but it is impossible to define with any degree of precision its geographic limits. The localities represented in the collections examined by me are indicated in a somewhat general way on the map accompanying a previous section (plate IV). The tribes by whom it was manufactured have evidently, at one time or another, occupied a large part of the Mississippi basin north of the mouth of the Missouri river. Parts of the states of Iowa, Wisconsin, Michigan, Illinois, Indiana, and Ohio are covered by this or by closely related ceramic groups, and traces of some of its peculiar characters are discovered far beyond these limits—as, for example, in New Jersey and Maine. There is some lack of uniformity within the group, and in time several subgroups may be distinguished, but the persistence of certain peculiar features in the widely separated localities goes far toward demonstrating a general unity.

The clay used exhibits no unusual features, but the tempering is always silicious and often coarse. The vessels have a narrow range of form and are such as were commonly devoted to culinary uses. There is, however, considerable diversity of detail, as will be seen by reference to the illustrations.

The decoration of this ware presents some striking features, the use of the roulette and the patterned punch stamp being especially characteristic. Cord-covered modeling tools were used in finishing the undecorated portions of the vessels, and pointed tools of various kinds were used in incising, trailing, and indenting patterns, as they were in other sections. In one locality a peculiar variety of patterned stamp was employed. Although the stamps were not quite the same as those used in the South Appalachian region, and were applied in a different way, taking the form of punches rather than of paddles, their use suggests a relationship between the art of the two sections, and this is enforced by the facts that features of ornamentation, shape, and material show unusually close analogies. Specimens of this class were obtained from mounds near Naples, Illinois, by Mr John G. Henderson and Mr M. Tandy.[a]

In plates CLXVI and CLXVII are reproduced a number of sherds illustrating the manner of applying the stamps, which must have been

[a] Henderson, John G., Aboriginal Remains near Naples, Illinois, in Smithsonian Report for 1882, Washington, 1884, p. 686.



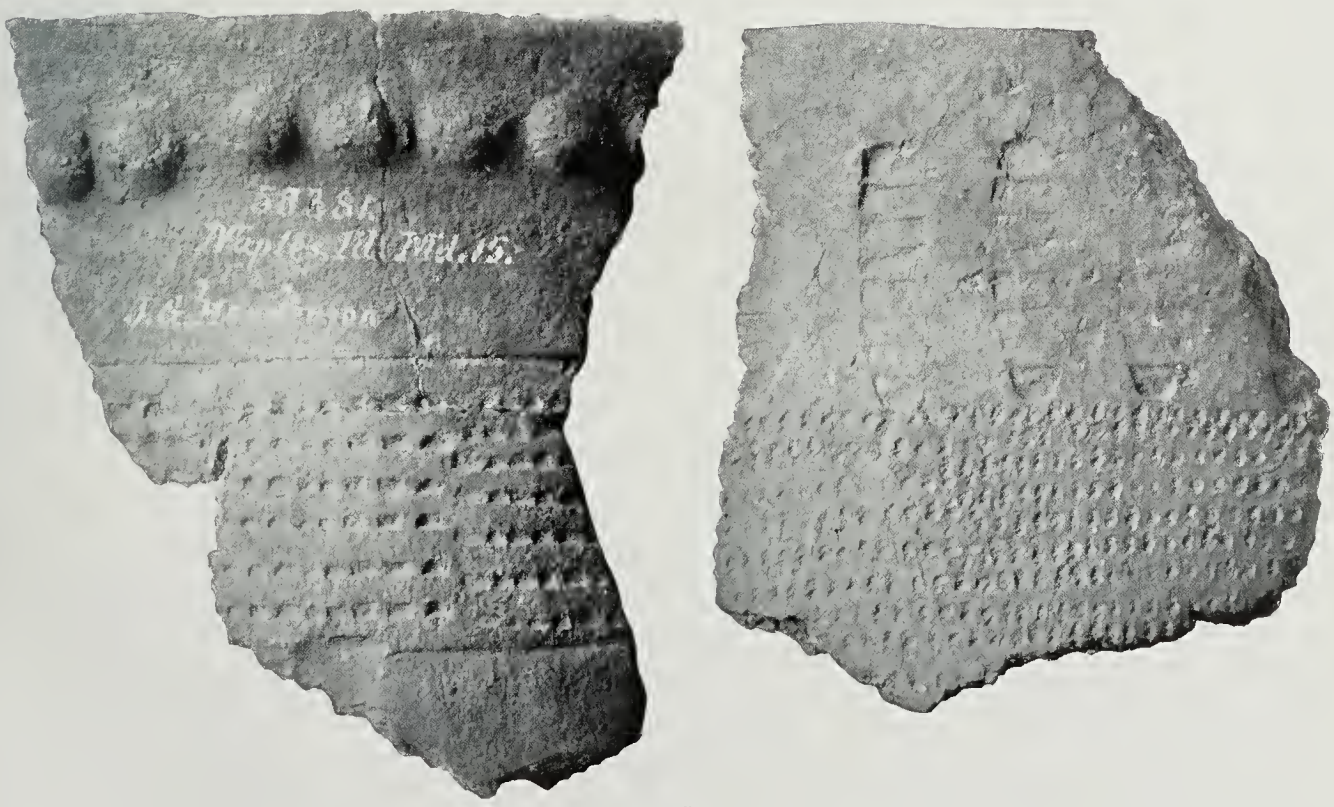
SHERDS OF STAMPED AND ROULETTED POTTERY, NAPLES, ILLINOIS

NORTHWESTERN GROUP

(THREE-FOURTHS)



b



a

SHERDS OF STAMPED AND ROULETTED POTTERY, NAPLES, ILLINOIS

NORTHWESTERN GROUP

(THREE-FOURTHS)



a (HEIGHT 4¼ INCHES)

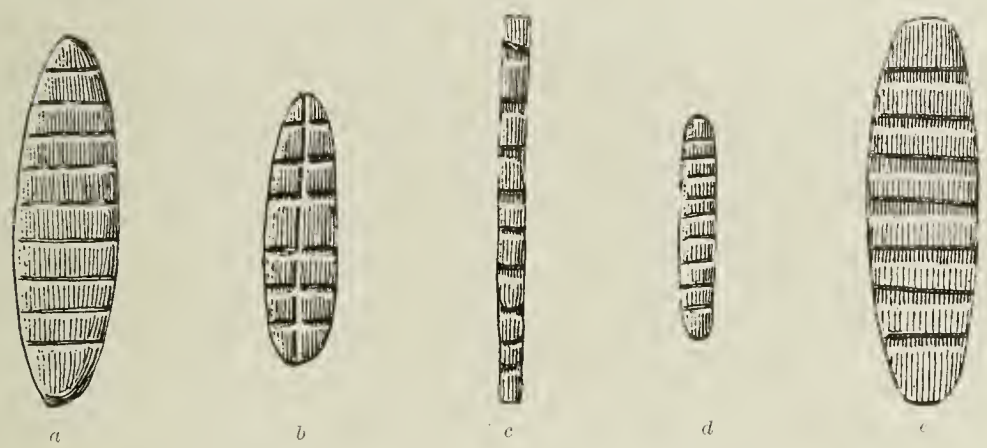


b (HEIGHT 6⅝ INCHES)

VASES DECORATED WITH THE ROULETTE, ILLINOIS

NORTHWESTERN GROUP

mere bits of wood with the ends dressed in various simple, flattish-oval shapes, and divided by transverse grooves; they were but a step in advance of the ordinary punches and puncturing tools used in nearly all sections in decorative work. These stamps were not used to produce the mixed, all-over patterns characteristic of the South Appalachian specimens, but were applied in a systematic way, the separate impressions being preserved, arranged in neat order to embellish margins and fill in spaces. A number of the impressions are given in figure 71. In plate CLXVIII two of the cruder examples of the Naples vases which happened to be susceptible of partial restoration are given. Particular attention may be called to the larger vessel, which, although belonging to this locality and to this particular group of vessels, is remarkably like the Georgia type, duplicating specimens from the Savannah in appearance, material, outline, and some of the details of decoration.



a *b* *c* *d* *e*

FIG. 71—Stamps used in decorating vessels (restored).

The pointed body has been textured with a cord-wrapped paddle or modeling tool, and the impressions have been partially obliterated in preparing the surface for the decoration. A punch was used to press out a row of beads encircling the rim; a stamp of the variety shown in figure 71*a* was applied to the outer margin of the rim; a roulette with irregular points was carried around the neck in a wide zone and below was crudely executed a design consisting of six sections, three of which are festoons of incised and indented lines, while the other three are carelessly traced coils produced in the same manner. The smaller piece, *a*, is also a South Appalachian shape.

Closely related in origin and effect to the stamped decorations described above is the work of the roulette, which especially characterizes this group of products. The implement, instead of being straight on the edge, like the stamps, took the shape of a wheel, or part of a wheel, with toothed edge. This was rolled back and forth over the surface to be decorated in the manner indicated in figure 72,

or was made to give broken lines, or to indent margins. A handle was probably used, as is indicated in the figure, the work being thus much more readily accomplished. Inexperienced observers would hardly be able to distinguish the markings made by the notched wheel from those made by the simple forms of notched or reticulated stamps, and by cords and fabrics, the general effect being much the same. In figure 73 is presented a small vase made by myself from ordinary potter's clay, and with it are the two tools, a notched roulette and a cord-wrapped roulette, used in finishing and embellishing its surface. The cord-wrapped stick served as a modeling tool to assist in shaping the vessel, in welding the clay together, and in rendering the surface even; at the same time it imparted the peculiar fabric-like texturing, which is not at all unpleasant to the eye. The band about the neck of the vessel was then smoothed with the thumb, and polished with a bit of smooth, hard wood. The rim or collar was smoothed also, and the notched wheel was run over it, reproducing the simple patterns characteristic of this group of vessels. A wheel with coarse notches was then rolled around the lower margin of the collar to give diversity and emphasis. The whole operation of building and decorating such a vessel need not consume more than half an hour. In many cases the potters of this and other northern groups, instead of notching the wheel, wrapped a hard twisted cord around it, applying it to the clay in the ordinary way.

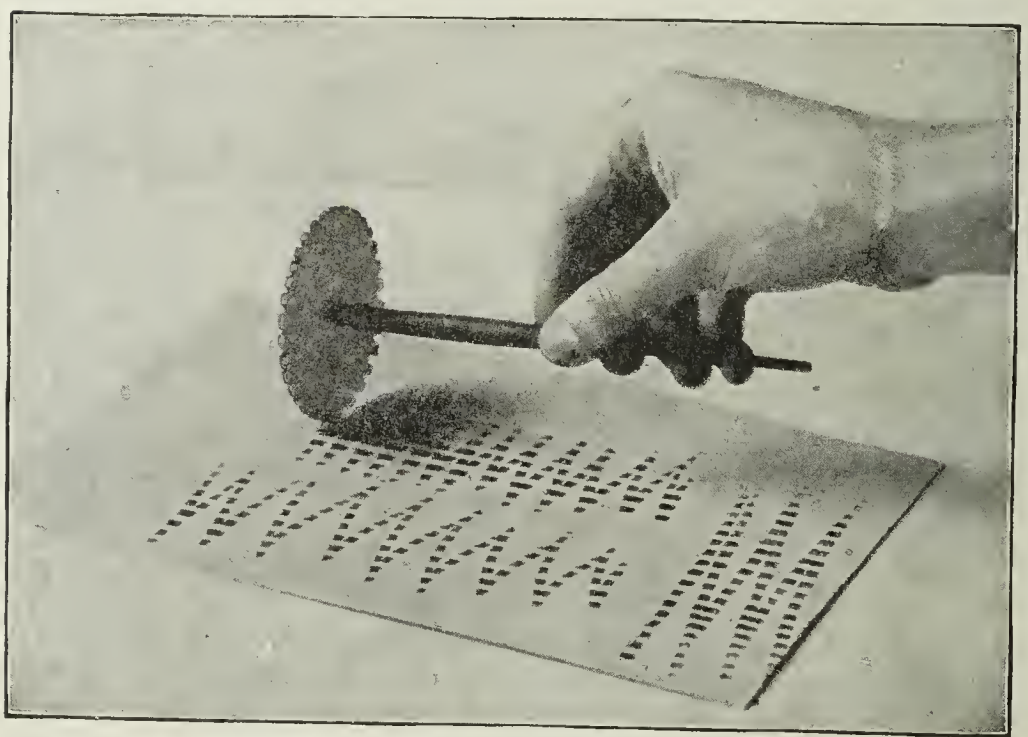


FIG. 72—Use of the roulette or rocking notched wheel. This wheel is made of pasteboard and inked to show impressions on paper.

In Indiana a number of localities have furnished examples of this ware, some of which may be considered quite typical. From a mound near Laporte Dr Higday procured several excellent pieces, described first by Foster,[a] and frequently illustrated in more recent works. I

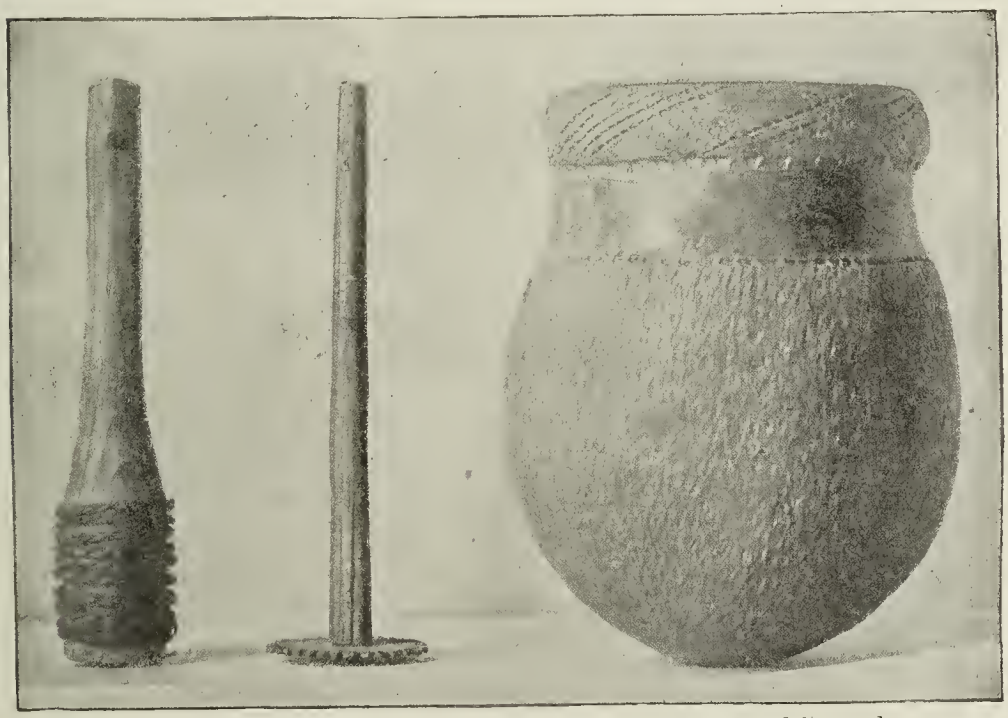


FIG. 73—Vase made for trial of the roulette and cord-wrapped modeling tool.

have not had the opportunity of seeing these pieces, but base my interpretation of the various features on the illustrations, reproduced in figure 74 *a*, *b*, and *c*. It appears that a square punch rather than



a *b* *c*

FIG. 74—Vases from a mound near Laporte, Indiana (Foster).

a figured stamp or notched wheel was employed in the decoration of these vases, but the shape, the laying off of the decorated spaces, and the manner of filling these in with indentations is decidedly characteristic of the wares under consideration. From Michigan again we

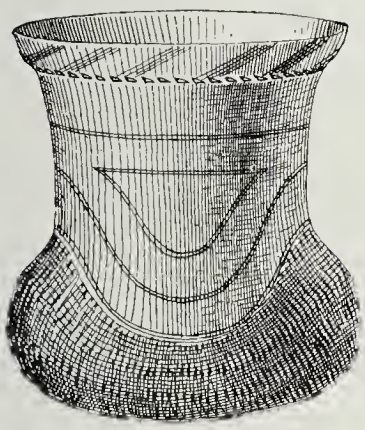
[a] Foster, J. W., Prehistoric races of the United States of America, Chicago, 1873, p. 247.

have several other very fine examples of this ware, three of which are shown in plate CLXIX *a*, *b*, *c* and *d*. All have a number of plain bands and figures, which alternate with roulette-indented spaces. The thickened rim in *b* and in *c* and *d* is covered with reticulated incised or rouletted lines, and the body is lobed, as it is in several specimens owned by the Kent Scientific Institute, Grand Rapids, Michigan.

Similar in general style to the preceding is the handsome little vessel obtained from a mound at Albany, Whitesides county, Illinois, illustrated in plate CLXX *a*. The shape and ornamentation are somewhat novel. Four flattish lobes occur about the body, on each of which a figure, somewhat resembling a Maltese cross, has been made by incising or impressing broad shallow lines. The remainder of the body is covered with marks that resemble impressions of a coarse osier basket, but which may have been made with a blunt stylus.

Another fine specimen is shown in plate CLXX *b*. This is one of a pair of handsome pieces recently obtained by the Bureau of American Ethnology from a mound in Vernon county, Wisconsin. It is $6\frac{1}{2}$ inches in height, and in symmetry and finish it rivals the best work of the South. The paste is dark, compact, and fine grained, and is tempered with fine sand. The color of the surface is a rich, mottled brown. The lip is smooth and the margin rounded. The outside of the narrow collar is ornamented with oblique incised lines, and is crossed at intervals by lines made with a notched wheel. The neck is slightly constricted, and is encircled by a polished zone $1\frac{1}{4}$ inches wide having a line of indentations along the upper edge. The body is separated into four lobes by four vertical, depressed, polished bands about 1 inch wide. Two of these lobes are crossed obliquely by similar polished bands. These bands were all finished with a polishing implement and are slightly depressed, thus giving rise to the somewhat lobed shape. They are bordered by wide, incised lines. The intervening spaces or lobes are indented with a roulette, moved back and forth in irregular zigzag arrangement.

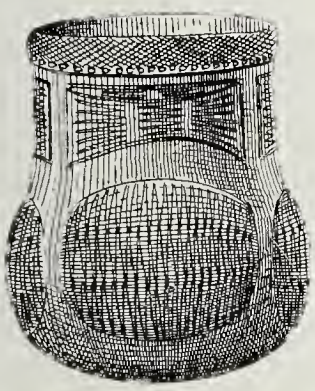
Specimens of this ware are found in Illinois as far south as Union county. On the west side of the Mississippi I know of no examples from localities farther south than Scott county, Iowa. Some of these were illustrated in the first volume of the Proceedings of Davenport Academy of Science. The vessel shown in plate CLXXI *a* was found in a mound near Davenport, closely associated with human remains and other relics, among which were several copper implements covered with coarse woven fabrics. Its height is 11 inches, the width of the aperture is $7\frac{1}{2}$ inches, and the diameter of the base is 4 inches. There is a broad, shallow constriction at the neck. The walls are from one-fourth to three-eighths of an inch thick, and the margin of the rim is squared off, showing the full thickness—a common feature in the northern pottery. The form is nearly symmetric and the surface is well smoothed, but is not polished. At present the paste is dark and



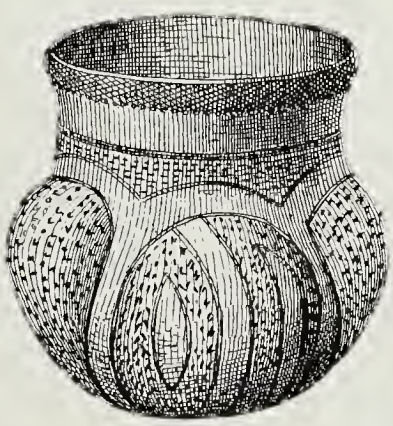
a (MICHIGAN)



b (MICHIGAN)



c (MICHIGAN)



d (MICHIGAN)



e (OHIO)



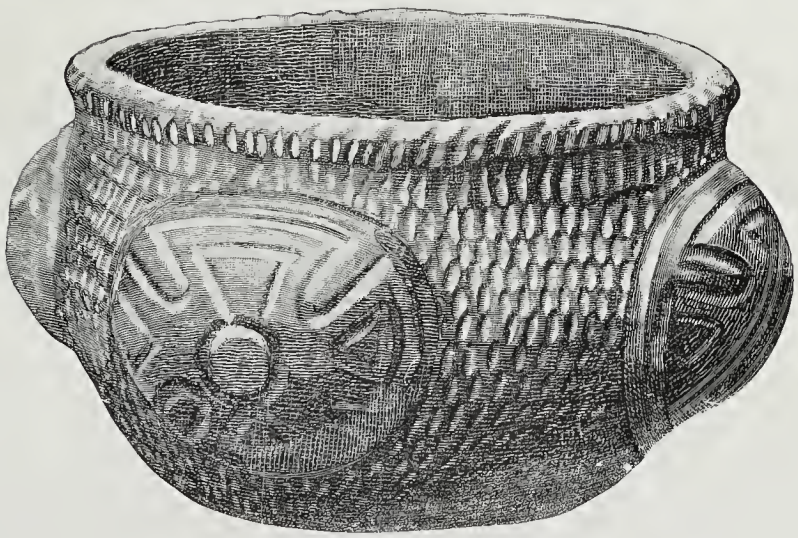
f (MICHIGAN, FROM SQUIER AND DAVIS, HEIGHT 5 INCHES)

EXAMPLES OF ROULETTE-DECORATED WARE

NORTHWESTERN GROUP



b (WISCONSIN, HEIGHT 6⅛ INCHES)



a (ILLINOIS, DIAMETER ABOUT 4½ INCHES)

EXAMPLES OF ROULETTE-DECORATED WARE

NORTHWESTERN GROUP



a (IOWA, DAVENPORT ACADEMY COLLECTION, HEIGHT 11 INCHES)



b (OHIO, FROM SQUIER AND DAVIS, HEIGHT 5⅛ INCHES)

EXAMPLES OF ROULETTE-DECORATED WARE

NORTHWESTERN GROUP

erumbling and shows a rough fracture. A large percentage of sand was used in tempering. The color is a dark gray-brown, and the entire surfaee, with the exception of a narrow band about the base, has been eovered with ornamentation. Two or three distinct implements have been used in the work. A part of the neck ornament was made by rolling back and forth a eircular tool, the edge of whieh was notehed. A row of indented nodes has been produeed upon the exterior surfaee of the neek by impressing upon the inside the end of a reed or hollow bone about one-fourth of an inch in diameter. Patterns of bold lines, rather carelessly drawn, cover the body, and seem to have been made by trailing under pretty strong pressure the smooth point of a stylus—probably the bone or reed implement already suggested. Some of the large indentations on the lower part of the neck may have been made by the same implement, held in an oblique position and used as a seoop. This vessel and several others of the same group and section are flat-bottomed. I regard this as very good evidence that the work is recent, and it may yet be shown that this ware and the mueh-diseussed engraved stone tablets of the same seetion are properly attributed to the tribes occupying the banks of the Mississippi long after the steamboat began its eareer on the Father of Waters. A similar vase, tastefully decorated with indented lines about the neek and a band of deeoration eonsisting of broad, plain, sinuous bands on the body, comes from a mound in Buffalo township, Scott eounty, Iowa. A vase from Ross county, Ohio, copied from Squier and Davis's Ancient Monuments, figure 2, plate XLVI, is presented in plate CLXIX*f*. The ornament in this case is apparently treated in mueh the same manner as in the Laporte speeimens, and the figure of a bird, quite eonventionally drawn, is paralleled in a similar vase, plate CLXIX*e*, obtained in Miehigan, the exaet locality not being known. The parallel holds good with respect not only to the bird and its treatment, but also to other features of ornamentation, and the vessels closely correspond in shape. A third speeimen decorated with bird figures was obtained by Dr H. F. Snyder from a mound in Illinois. The vase and design are presented in figure 75. In the museum of the Historieal Soeiety of Missouri at St Louis is still another vessel of this type, and another handsome vase of the same general class, eopied from Squier and Davis, page 189, appears in plate CLXXI*b*.

It is a significant fact, in this eonnection, that the few pieees of pottery found by Mr Moorehead in the Hopewell mounds, near Chillicothe, Ohio, are of this general type. Illustrations are given in plate CLXXII. The large fragment *a* shows the usual incising and roulctting, and the shape is equally eharacteristic, resembling most closely, perhaps, that of the Iowa specimens already described. The restored shape appears in *b*, and the outline of a small piece with roulctted rim, cord-paddled body, and conic base is shown in *c*.

It would seem that the builders of the great mound groups about Chillicothe, the enterprising people who gathered stores of shells from the Atlantic, copper from Lake Superior, flint from the lower Ohio valley, and obsidian from the Rocky mountains, Oregon, or Mexico, were identical with or closely related to tribes scattered over a large part of a region including parts of Ohio, Indiana, Illinois, Iowa, Michigan, and Wisconsin. Though the pottery of this group of peoples is not nearly so highly developed as is that of the southern mound-builders, as, for example, those of Cahokia, in Illinois, and of Etowah, in Georgia, there can be little doubt that their general culture was of an order equally advanced.

With respect to the origin of the great numbers of obsidian implements found in the Hopewell mounds, it may be well to note that there is no trace of Mexican characters in the pottery of these mounds; besides, the general trend of the group of ware here associated is from Chillicothe toward the northwest, suggesting the upper Missouri region or the valley of the Columbia as the source of the obsidian. The significance of this observation is emphasized by the discovery of fragments of rouletted ware in the Yellowstone National Park, where great beds of obsidian are found (see page 201).

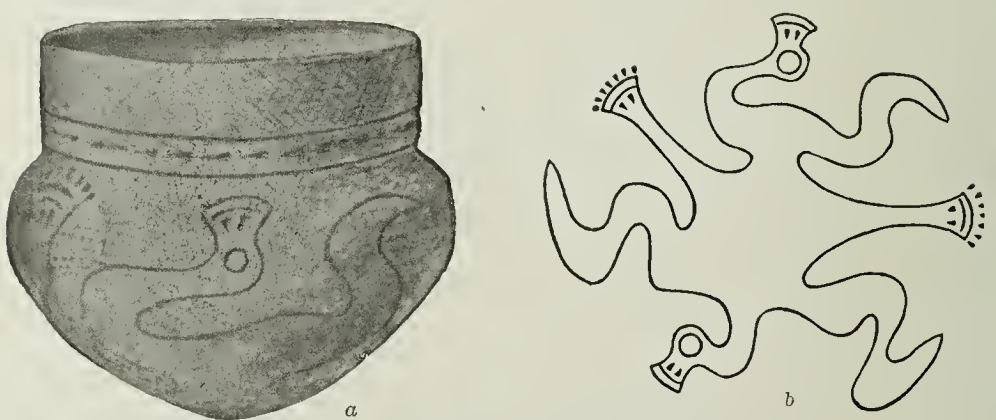


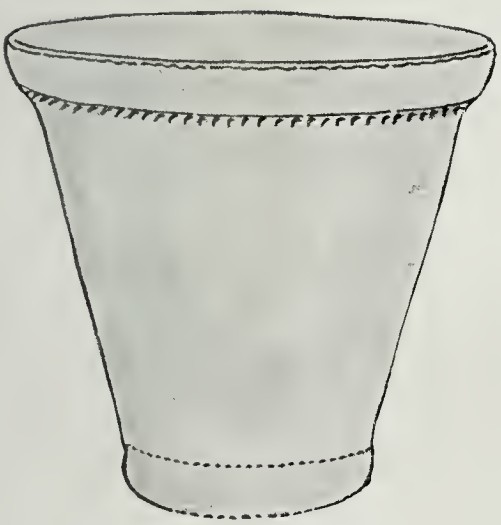
FIG. 75—Vase with conventionalized bird design. Drawings furnished by Dr H. F. Snyder.

CORD- AND TEXTILE-MARKED WARE

Pottery of typical archaic form is distributed over a vast area in the Northwest. It connects with the corresponding wares of Virginia, Maryland, Pennsylvania, New York, and Canada, and its occurrence is very general and uniform over the Great lakes region, the upper Mississippi, the Missouri, and Red river of the North valleys, and it is found with decreasing frequency in the far-away Yellowstone country, and even, in rare cases, in the Green river valley and in Great Salt lake basin. In more or less typical form it extends over into the Middle Mississippi and South Appalachian ceramic provinces.



c (DIAMETER 5 INCHES)



b (DIAMETER ABOUT 7 INCHES)



a (DIAMETER ABOUT 7 INCHES)

EXAMPLES OF ROULETTE-DECORATED WARE FROM HOPEWELL MOUNDS, ROSS COUNTY, OHIO

NORTHWESTERN GROUP

(MOOREHEAD COLLECTION, FIELD COLUMBIAM MUSEUM)

It is the product of peoples of the same general level of culture as those found in possession of the region, and is no doubt largely the work of the present inhabitants, the modern representatives of the great Algonquian and Siouan families. A number of these tribes continued to practice this art down to the period of English and French occupation, and the Mandans, the Grosventres, and possibly others, were making their simple ware until within the present generation.

Catlin describes the work of the Mandans (Siouan family) of sixty years ago, and his account is quoted in the introductory pages of this paper. Traditional accounts of the practice of the art are given by several authors. George Bird Grinnell, already quoted in the introduction, records definite traditions of the making of pottery by the Pawnees, and Mr A. J. Comfort states that—

> Earthen vessels were in use by our Dakotas during the childhood of men still living (about 1870). I have interrogated separately and on different occasions the principal and most reliable men of the Sissiton and Wahpeton tribes, all of whom tell the same story of having seen earthen kettles for culinary purposes in use by their parents.[a]

An early explorer in the great Northwest, the Prince of Wied, speaking of the Mandans, Minitaris, and Arikaras, declares that—

> These three nations understand the manufacture of earthen pots and vessels of various forms and sizes. The clay is of a dark slate color and burns a yellowish red, very similar to what is seen in the burnt tops of the Missouri hills. This clay is mixed with flint or granite reduced to powder by the action of fire. The workwoman forms the hollow inside of the vessel by means of a round stone which she holds in her hand, while she works and smooths the outside with a piece of poplar bark. When the pot is made it is filled and surrounded with dry shavings and then burnt, when it is ready for use. They know nothing of glazing.[b]

It is quite impossible to present this pottery in detail, and the wares of a few widely scattered localities may be chosen as typical of all. Wisconsin has many sites rich in sherds of this ware. Two Rivers, situated midway on the west shore of Lake Michigan, occupies an ancient and important village site, and large quantities of pottery fragments have been unearthed through the persevering efforts of Mr H. P. Hamilton, of the city; many of these specimens have been preserved and placed within the reach of students. The large vessel shown in plate CLXXIII was dug up in 1901, and is described as follows in a letter transmitting the photograph here reproduced:

> I have just succeeded in restoring an earthen vessel—the first I have been successful with, and I have been trying for years. This vessel was discovered in the sand about four blocks from our office, near the lake shore, where innumerable vessels have been destroyed. The sand had thawed out for about 4 inches and the vessel was broken into some 200 pieces. Hot water and fire were resorted to and most of

[a] Comfort, A. J., Smithsonian Report, 1871, p. 402.

[b] Maximilian (Prince of Wied), Travels in the Interior of North Ameriea, p. 348.

the vessel was finally secured. The fragments were so soft and easily broken while wet that they would easily crumble if held in the hand, but after being dried they became quite hard. It was quite a difficult task to join the pieces, especially toward the completion, when the restored large pieces had to be joined, but it was finally accomplished. The vessel is 13 inches in height and 4 feet in circumference. The weight is 10 pounds. The top opening is oblong, 10 inches the narrow way and 12 inches the wide way. Two pairs of holes have been bored in one side, probably for inserting cords for the purpose of checking an incipient crack. The ornamentation is not as elaborate as on some pieces I have found here, but still is very fair. A skeleton was buried with it, but nothing could be saved of this except some fragments of the skull.

The smaller vessel shown in this plate is about the size of an ordinary coffee cup, and is similar in character to the large piece.

The pottery of this site presents pronounced Algonquian characters, and if the sherds were to be intermingled with those of Atlantic coast sites it would be difficult to separate them. Plate CLXXIV contains fragments of rims of ordinary vessels. It will be seen that one of these has a sharp projection, such as is frequently seen in the Iroquoian ware of New York, and it is further noted that the mouth of the

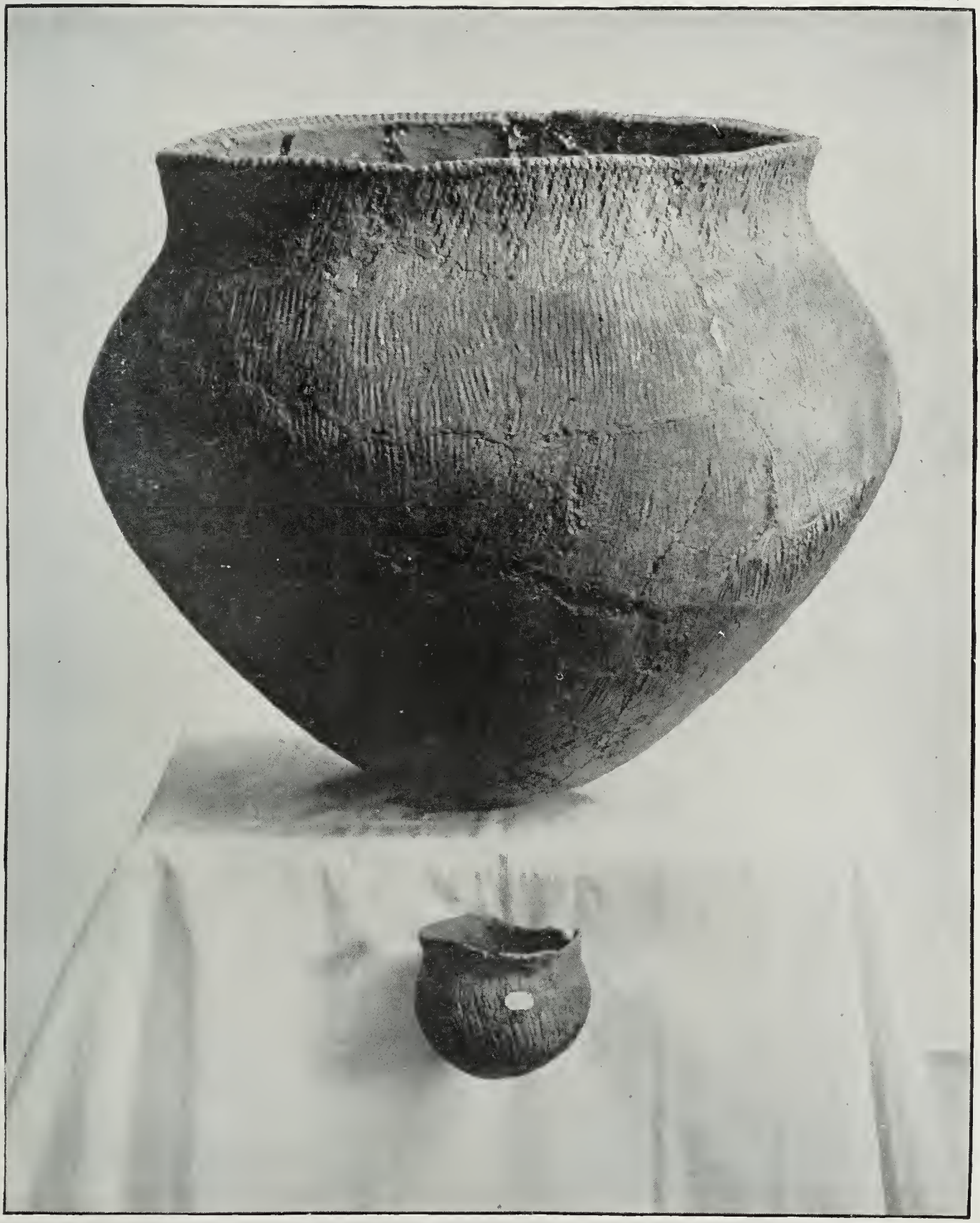


FIG. 76—Sections of rims of vases from a village site at Two Rivers, Wisconsin

vessel was squarish, emphasizing the likeness to the Iroquoian work. It is not at all impossible that the influence of the powerful tribes of New York extended to the western shores of the Great lakes, but since this angular form is undoubtedly due to the influence of bark vessels, it may have had an independent origin in the West.

The paste of this pottery is not very fine grained, and it is tempered with silicious particles, sometimes rather coarse. The pot or caldron presents variants in form extending from deep bowl shapes, on the one hand, to rather tall jar shapes, on the other. In size the specimens vary from minute cups to vessels 18 or 20 inches in diameter. The base is rounded or conic, the shoulder is often slightly angular, and the neck is more or less sharply constricted. The rim is generally turned outward. The lip is much varied in form and embellishment. Profiles are shown in figure 76.

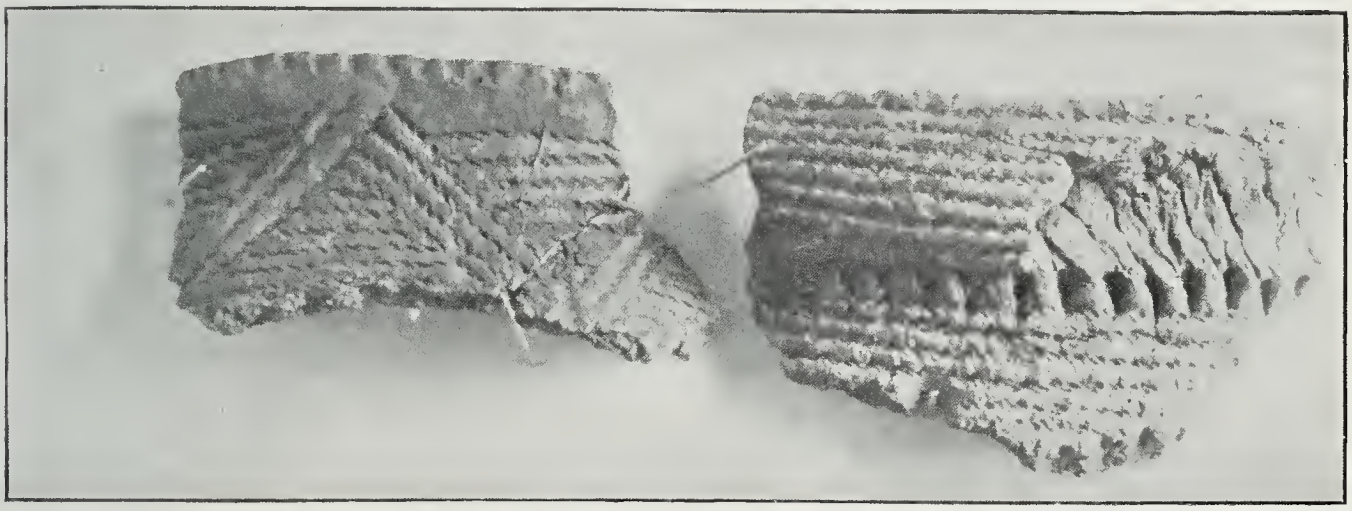
The surface is generally well covered with texturing and decoration. The body has been finished by paddling or rocking with textile-covered tools, or by cord-wrapped roulettes—usually, I believe, the



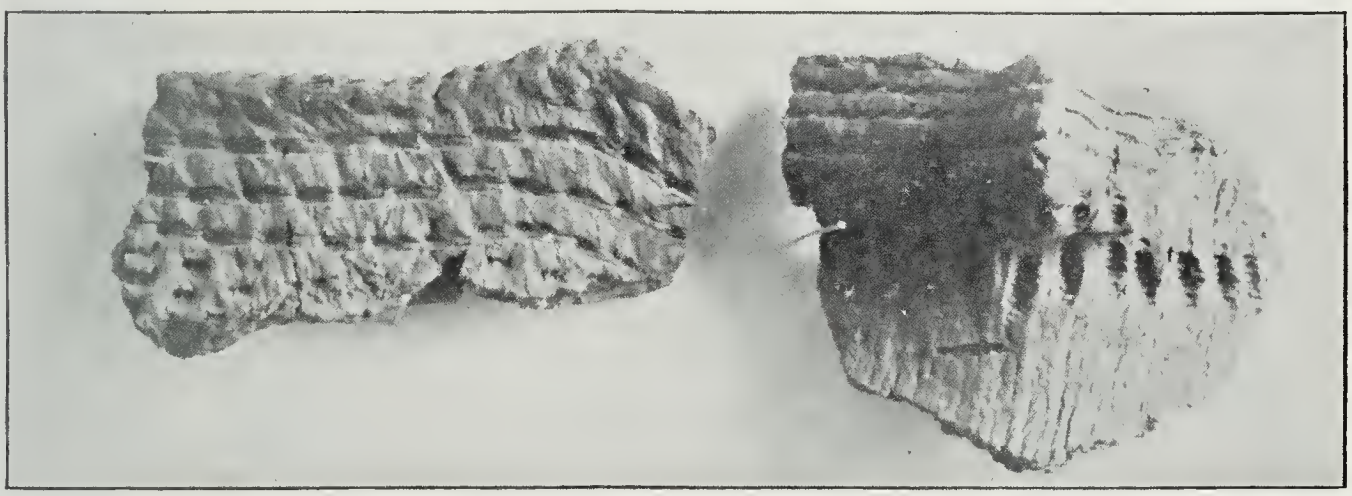
LARGE VASE FROM A VILLAGE SITE, TWO RIVERS, WISCONSIN

NORTHWESTERN GROUP

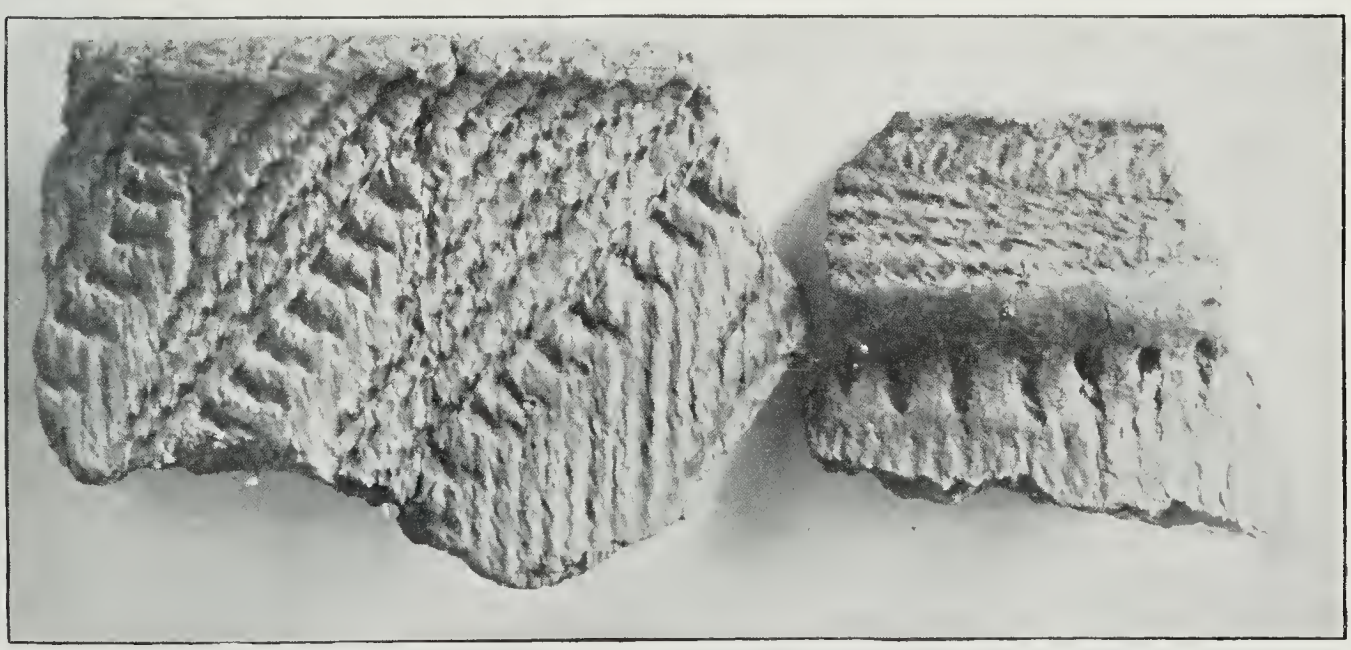
(HAMILTON COLLECTION, DIAMETER OF TOP 11 INCHES)



a



b



c

POTSHERDS FROM A VILLAGE SITE, TWO RIVERS, WISCONSIN

NORTHWESTERN GROUP

(HAMILTON COLLECTION, ABOUT ACTUAL SIZE)

latter—the implement having been rolled up and down from rim to base, leaving approximately parallel imprintings, as is indicated in some of the specimens illustrated. After the malleating process was finished, the neck and rim were smoothed down and decorated in various ways, most generally by impressing cords into the soft clay, producing patterns, or by merely repeating indentations of the cord laid on flat or doubled up, making deep indentations. This treatment extended to the margin of the lip and, in cases, to the interior surface. Trailed and incised lines and punctures are seen in numerous instances, and in the vessels suggesting Iroquoian relationships the patterns resemble those characterizing the Iroquoian ware.

The National Museum collections contain fragments of a well-made vessel from Lake Nipigon, western Ontario, 500 miles north of Two Rivers. The ware is of much better make than the pottery south of Lake Superior, and has rather decided Iroquoian characters. The paste is silicious and

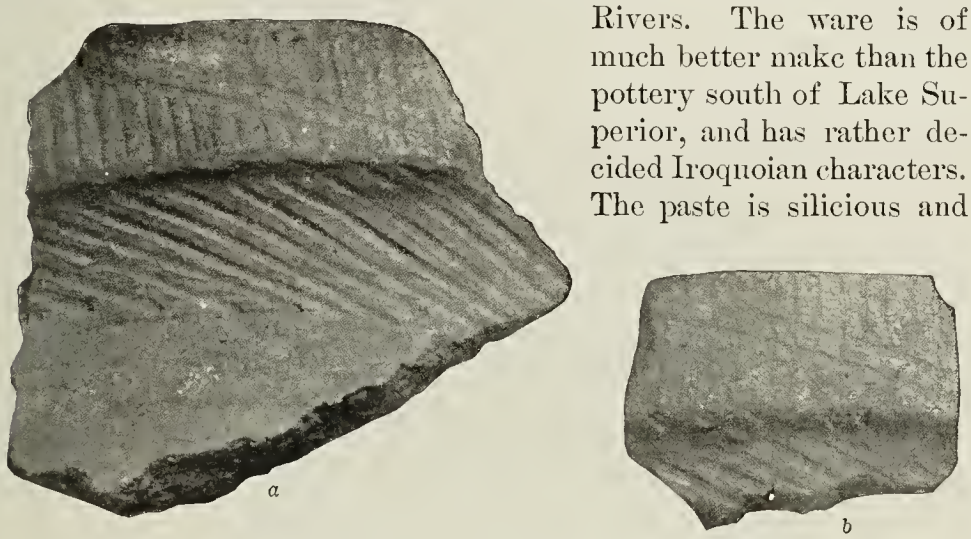


FIG. 77—Fragments of a large vase from Lake Nipigon, Ontario

heavy, the walls thick, the body well polished, and the neck and thickened collar decorated with strongly drawn patterns of incised straight lines. The fragments are shown in figure 77.

MANDAN POTTERY

It is fortunate for the student of primitive ceramics that at least one tribe continued the practice of the art down to the present period. The Mandans may even yet at times renew the work of pottery manufacture, but no record of this has been made for several decades. The work of this tribe is described by Catlin and is represented by several specimens preserved in our museums. It serves as a key to the great group of ware now under review, connecting it closely with the Siouan peoples—the buffalo-hunting tribes—the typical wild tribes of North America. To be sure, the Mandans lived in permanent villages composed of substantial earth lodges, were largely sedentary, and on account of their remoteness naturally kept up the practice of primitive

industries longer than the equally sedentary tribes of the same family farther south.

Catlin's account of the pottery making of the Mandans is quoted in full in the introduction, and I need do no more here than present the illustrations, plate CLXXV. The vessel shown in *a* is 6 inches in diameter and 6 inches in height, about the average size, and strong and neatly made, of grayish-yellow clay tempered with sand or pulverized crystalline rock. Its characteristics of form are the wide mouth with rim developed into a wide collar, to which two handles are attached, alternating with two angular projections. The body swells but little, and terminates in a rounded cone below. The general surface was finished, first, with the usual cord-wrapped implement, traces of the imprintings being still seen about the neck. After this, the surface was finished by application of a tool producing impressions such as would be made by a paddle wrapped with straw or rushes; they are plainly to be seen in the illustration. Next, the neck and rim were rubbed down, obliterating the imprintings, and the collar and handles were embellished by impressing strong cords in simple, angular patterns. Triangular spaces at the top of the handles and over the alternating projections have received each three imprintings from a round-pointed stamp, probably the end of a stick, about one-fourth inch in diameter. Possibly these indentations may stand for the eyes and mouth of some animal, while the cord imprintings of the rim stand for the markings of the body. The specimen was received from Dr Washington Matthews, U. S. A., stationed at Fort Stevenson, North Dakota, in 1868. A very similar specimen is credited to the Grosventre tribe.

Specimen *b*, collected by General William B. Hazen, Chief Signal Officer, is recorded without assignment to any tribe. It was associated, however, with Sioux relics, and doubtless came from the Mandans, as it duplicates in nearly every particular the specimen described above. The body shows no traces of textile markings, but the entire surface is covered with impressions made by a paddling tool, and certain impressions about the neck suggest that this was possibly a bit of wood, carved with alternating low ridges and shallow grooves. The collar is without the three indentations seen in the other specimen. The color is terra-cotta, mottled with black cloudings, produced by the firing. Dried mush adheres to the inside and extends in lines—as if from boiling over—down the sides of the vessel. This latter feature and the presence of a buckskin carrying-band indicate recent origin and use.

The two specimens given in plate CLXXVI belong also to the Hazen collection, but, not being assigned to any locality or people, they should be referred to with caution. They possess, however, numerous features in common with Mandan work. Possibly they were obtained



a (DIAMETER 6 INCHES)



b (HEIGHT 7⅛ INCHES)

POTTERY OF THE MANDAN INDIANS, DAKOTA

NORTHWESTERN GROUP



a



b (HEIGHT 6⅛ INCHES)

POTTERY FROM THE MISSOURI VALLEY (?)

NORTHWESTERN GROUP

from village or burial sites at some point on the Missouri river. Specimen *a* has been finished by paddling with an implement wrapped with fine cords, and specimen *b* is tempered with shell, and has rude scrolls scratched on the four lobes of the body. These features would seem to connect the specimen with ware of the Middle Mississippi group.

Pawnee Pottery

The National Museum contains an interesting lot of fragments of earthenware brought in by Dr F. V. Hayden about the year 1867. A



Fig. 78—Outlines of vases from a Pawnee (?) village site, east-central Nebraska. Restored from large fragments.

few pieces are shown in plate CLXXVII. They are from a Pawnee village site on Beaver creek, Nebraska, in the east-central part of the state. They exhibit unusual variety of form and ornament, but nearly all appear to represent small pot-shaped vessels, a striking characteristic being the many handles. In this respect they suggest the handled pots of western Tennessee, illustrated in plate XII. The prevailing form is illustrated in outline in figure 78.

The fragment of a pipe (figure 79) found with these sherds is an unusual feature in the far Northwest.



Fig. 79—Fragment of a clay pipe from a Pawnee (?) village site, east-central Nebraska.

The paste of this ware is gray, with dark fire-mottlings, and it is not very hard. It is tempered with sand and, in cases, with grains of some dark crystalline rock. In general appearance the vessels are much like those of Mandan manufacture. The rounded bodies of the vessels, as a rule, have been finished with cord-wrapped or ribbed implements, and the necks, handles, and rims have been smoothed off to receive the decoration of incised lines and indentations. In some cases the body has been rubbed smooth and left plain, and in others the incised ornamental markings have been carried down over nearly the entire surface, as is shown in the middle left-hand figure of plate CLXXVII.

The following paragraphs are quoted from Dr Hayden's account:

All along the Missouri, in the valleys of the Little Blue, Big Blue, Platte, and Loup Fork rivers, I have observed the remains of these old dirt villages, and pieces of pottery are almost invariably found with them.

But on a recent visit to the Pawnee reservation on Loup Fork I discovered the remains of an old Pawnee village, apparently of greater antiquity than the others, and the only one about which any stone implements have as yet been found. On and around the site of every cabin of this village I found an abundance of broken arrowheads, chipped flints, some of which must have been brought from a great distance, and a variety of small stones, which had been used as hammers, chisels, etc. I have gathered about half a bushel of the fragments of pottery, arrowheads, and chipped flints, some of which I hope to place in the museum of the Smithsonian next winter. No Pawnee Indian now living knows of the time when this village was inhabited. Thirty years ago an old chief told a missionary that his tribe dwelt here before his birth.[a]

Other Northwestern Pottery

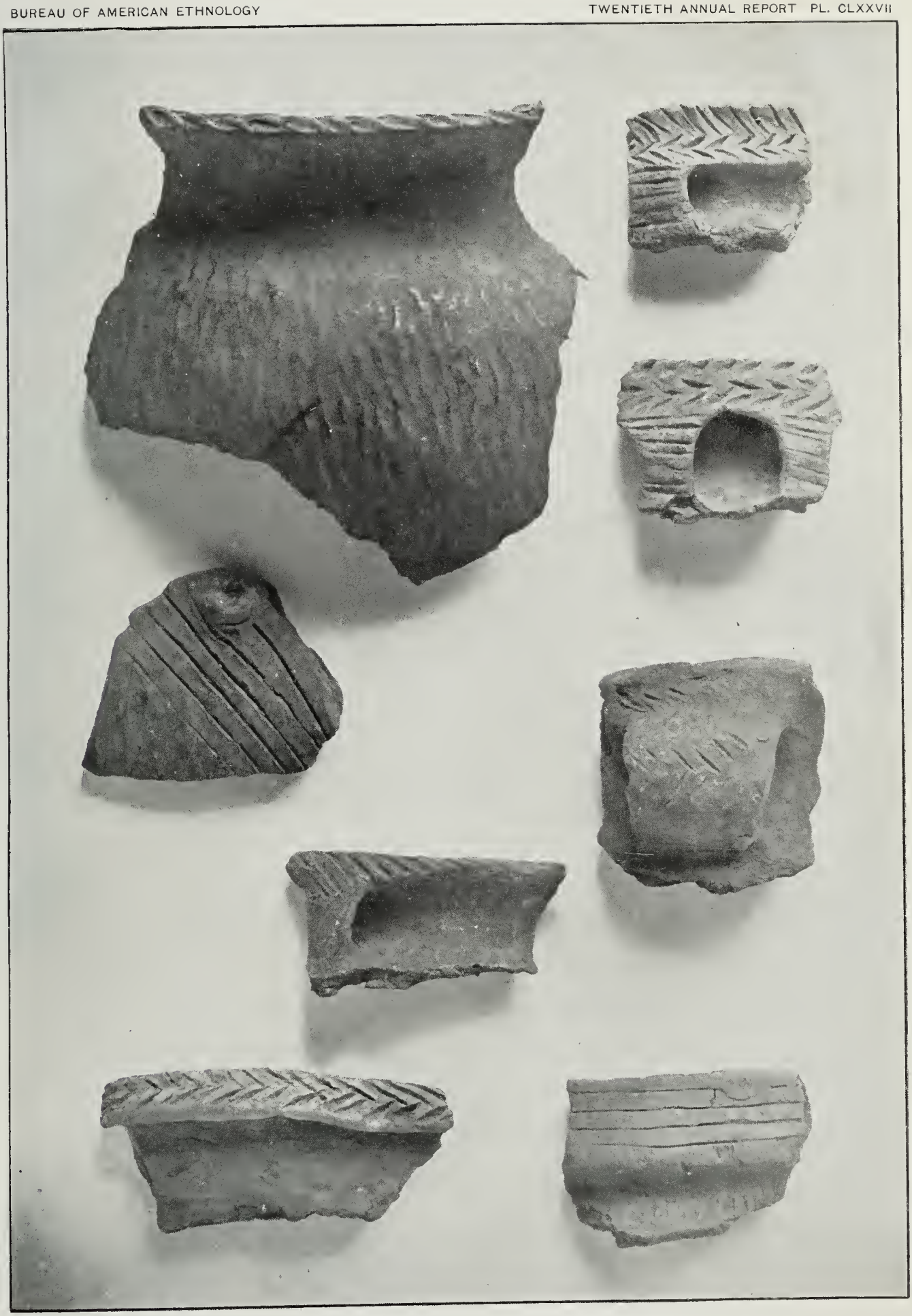
From a mound near Fort Wadsworth, North Dakota, Mr A. J. Comfort obtained much fragmentary pottery, and his descriptions, being detailed and interesting, are quoted:

The sherds were evidently from some vessels no larger than a small jar or goblet and from others whose capacity must have been 4 or 5 gallons. * * * The thickness of these sherds varies from one-eighth to three-eighths of an inch, according to the size of the vessel, though few exceed one-fourth. Sand has been the only substance used to give stiffness to the mass during process of molding and prevent the ware from cracking while burning, and has probably been obtained from disintegrated stones, some of which were found on the hearths elsewhere spoken of. I have been able to find no whole vessels, but from the fragments of the rims, sides, and bottoms it is not difficult to form a fair conception of their shape, which, for aboriginal art, was wonderfully symmetrical, gradually widening from the neck or more constricted portion of the vessel until it attains its greatest diameter at a distance of one-third of the height from the bottom, which is analogous, in curvature, to the crystal of a watch. To the neck is attached the rim, about 1 inch in width, though sometimes 2; this slopes outward at an angle of about 20 degrees from a perpendicular. * * * I have found no pieces containing ears or handles, though an Indian informant tells me that small vessels were supplied with ears.

That the aboriginal potters of the lacustrine village of Cega Iyeyapi were fond of decoration, and practiced it in the ceramic art, is shown by the tracings confined to the rims. Rim ornaments co..sist of very smooth lines about one-twentieth of an inch in width, and as deep, drawn quite around the vessels, parallel to the margin. These are sometimes crossed by zigzag lines terminating at the neck of the vessel and the margin of the rim. Lines drawn obliquely across the rim of the vessel, and returning so as to form the letter V, with others parallel to the margin of the rim, joining its sides, the same repeated as often as space admits, constitute the only tracings on some vessels. The inside of the vessels is invariably plain. . . .

The outside of the vessels proper, exclusive of the rim, which is traced, bears the impression of very evenly twisted cords running in a parallel direction and closely crowded together, the alternate swelling and depression of whose strands have left equidistant indentations in every line thus impressed. These lines run, on the sides of the vessels, in a direction perpendicular to the rim, and disappear within a half

[a] Dr F. V. Hayden, Smithsonian Report, 1867, p. 411.



POTTERY FROM A PAWNEE VILLAGE SITE, NEBRASKA

NORTHWESTERN GROUP

(ABOUT THREE-FOURTHS)

of an inch or an inch of it, each indentation becoming indistinct near the end. I have counted from ten to fifteen of these casts in the space of a linear inch, and yet some of the sherds represent much finer cords.[a]

The ware of the Mississippi valley proper naturally extend far up the western tributaries, and a few fragments have been found in the Yellowstone Park, one of the most remote and inaccessible localities in the country. These fragments were brought in by Colonel P. W. Norris, Superintendent of the Park, in 1880. They represent a large jar or pot with upright neck. The material is coarsely silicious and the walls are thick. Just below the rim is a line of nodes made by punching with a round implement from within, and there are indistinct traces of roulette-markings. These pieces have a close analogy with the roulette-stamped ware of Naples, Illinois, and therefore with the whole rouletted group.

A few fragments of very archaic ware have been gathered in Idaho and on the site of Salt Lake City, Utah. These seem to be related to the primitive northern pottery, rather than to the Pueblo ware of the South.

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[a] Comfort, A. J., in Smithsonian Report for 1871, pp. 400–401.

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